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FIG. 1.
SPINA BIFIDA.



FIG. 2.
VARICELLA



FIG. 3.
FACIAL ECZEMA.



FIG. 4.
HERPES FACIALIS

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A HAND-BOOK
ON THE
DISEASES OF CHILDREN
AND THEIR
Homeopathic Treatment.

ILLUSTRATED.

A Text-Book for Students, Colleges and Physicians.

BY

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TO

FRANCIS H. OXME, M.D.,

IN GRATEFUL ACKNOWLEDGMENT OF THE
SUSTAINING COUNSEL AND ENCOURAGEMENT
THAT HE HAS GENEROUSLY EXTENDED THE
AUTHOR DURING MANY YEARS OF PROFES-
SIONAL AND JOURNALISTIC LABOR THIS VOL-
UME IS AFFECTIONATELY DEDICATED.

PREFACE.

The present volume is the outcome of a conviction upon the part of the author that there exists a vacancy in the literature of homoeopathy in the department of pediatrics which demands to be filled. Written from the viewpoint of the bedside practitioner the book is intended to serve as a text-book for students and beginners in practice and a work of ready reference and resourceful comfort for the busy doctor of the general field as well. More than twenty years of the author's professional life have been spent in sections where homoeopathic physicians were few and their system comparatively unknown, with consultants not often at hand, self-reliance being demanded. For those similarly situated and also for those who prefer to work out their own salvation in difficult cases the book has been prepared. It is believed it is more complete than any similar volume of its profession, though doubtless lacking in many respects and far from perfect. For sins of omission and commission the lenient consideration of the profession is courted. Attempts to remedy defects will be made in subsequent editions. In treatment a stricter loyalty to Hahnemann's law and the established practices of the early fathers than is now generally practiced is observed, the experience of the author through nearly a quarter of a century of bedside labor fully sustaining the solid tenet of the homoeopathic rule in the application of remedial agents to the diseases of little folks.

The author's acknowledgments are extended to Prof. H. C. Allen and Prof. W. J. Harkes for kindly confirming the therapeutics of a few important chapters, and to Dr. Emmet L. Smith, for the preparation of the index.

Chicago, July, 1895.

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PLATES.

PLATE I.

Fig. 1. Spina Bifida.

Fig. 2. Varicella.

Fig. 3. Facial Eczema.

Fig. 4. Herpes Facialis.

PLATE II.

Fig. 1. Gangrenous Stomatitis.

Fig. 2. Ulcerative Stomatitis.

PLATE III.

Fig. 1. Pneumococcus.

Fig. 2. Bacillus Cholera.

Fig. 3. Streptococcus.

Fig. 4. Pseudo-Diphtheria Bacillus.

Fig. 5. Staphylococcus Pyogenes

Aureus.

Fig. 6. Diphtheria Bacillus.

Fig. 7. Bacillus Tuberculosis.

Fig. 8. Diphtheria Colonies.

Fig. 9. Pseudo-Diphtheria Colonies.

Fig. 10. Bacillus Typhosus.

PLATE IV.

Fig. 1. Aphthæ.

Fig. 2. Peritonsillar Abscess.

Fig. 3. Mucons Tongue.

Fig. 4. Follicular Tonsillitis.

Fig. 5. Scarlatinal Tongue.

Fig. 6. Chronic Hypertrophy of Tonsils.

Fig. 7. Syphilitic Ulceration of Tonsil.

PLATE V.

Tenia.

DISEASES OF CHILDREN.

SECTION I.

PHYSIOLOGY AND DISEASES OF THE NEW-BORN.

CHAPTER I.

GENERAL EXAMINATION.

General Considerations—Family History—Inspection—Pulse—Temperature—Physiological Hints—Respiration—Weight—Sight and Hearing—Senses—Intestinal Canal—Urine—Crying—Diagnostic Hints.

General Considerations.—The study of the diseases of children is one of the most fascinating subjects in medicine. Practice among little folk forms not only the bulk of the work of the general practitioner, but it is his most attractive field, providing always that he is well acquainted with their ailments and is possessed of that milk of human kindness that is a component part of the character of the conscientious and painstaking physician. The very helplessness and innocence of children during the earlier years of their lives should arouse within the physician his most earnest sympathy and the exercise of his very best efforts towards the relief of their sufferings and the saving of their lives. Unable to communicate their distresses in words, it becomes his imperative duty to study their language of pain and disturbance of function, and to interpret for their benefit by all means at command their tales of sorrow and their signs of anguish. It cannot be too strongly impressed upon the mind of the student and commencing practitioner that it is his paramount duty to give serious consideration to the ailments of every infant entrusted to his care. What may appear at first to be a simple ailment may so quickly develop into a fatal illness as to result in the loss of life. What seems to be a very slight disturbance of the digestive func-

tions, for instance, may quickly develop into an incurable enterocolitis. Huskiness of the voice and a simple cold in the head may mean membranous laryngitis a day or two later. The simple vomiting spell, attributed to overloading of the stomach, may be the first symptom of scarlet fever or dangerous gastritis. Precocity and fretfulness, attributed to the cutting of teeth, a display of temper, or acute indigestion, may be the initial symptom of meningitis. In fact, it is never safe to slight any ailment of childhood. While it is desirable not to give unnecessary concern to the mother of a young babe by over-seriousness of mien, yet it is far better to err on the side of too serious consideration of a slight ailment than to carelessly allow a fatal illness to creep in unobserved.

Naturally the inability of the infant to tell of its sufferings makes it quite difficult to at all times comprehend the character of infantile illness; and such physical symptoms as increase of temperature, disturbance of the digestive organs, various facial expressions, nervous perturbation, its cry, and the various departures from the normal tone of the healthy child, will have to be relied on as indices to its physical state. Nor is the physician always justified in accepting the interpretation of the mother or nurse; the former is quite likely to be influenced in her judgment by her sympathy and her fears, while nurses in many instances are so supremely careless and unable to understand the unexpressed complaints of their charges that the physician cannot rely upon their efforts to make clear the physical picture before him. He must study each case for himself.

Family History.—In a general way it is necessary to a clear diagnosis that the physical genealogy of a sick child be inquired into. Tubercular parentage, or dyscrasia, influences the course and prognosis of a large number of infantile diseases, especially those of the lungs, brain and bowels. Syphilis influences diseases of the bony, integumentary and nervous systems. Rheumatism has its bearing upon the heart and joints, while epilepsy, chorea and other nervous diseases, on either side of the house, especially on the maternal side, make their influences felt in the physical and mental development of the offspring of persons so afflicted. And so on throughout the list of constitutional diseases; so that when called to see a sick infant whose case is not of the simpler order it is important to always inquire carefully into its pre-natal and antecedent history, and especially is this proper in homeopathic practice. So many constitutional dyscrasias will have to be approved in order to insure perfect health in child-life that a complete genealogical picture is often essential to the best possible work.

Inspection.—There are certain physical signs presented to the eye which have significance that should not be overlooked. Abdominal pains will almost invariably reflect themselves upon the countenance of the child, in the expression of pain and suffering

seen especially on the lower part of the face, about the mouth and angles of the nose. The mouth will be drawn and the face pinched, and the whole expression one of manifest distress and suffering. Headache and incipient meningeal symptoms will show themselves by expression in frowns, wrinkling of the forehead and drawing or rolling of the eyes. The heaviness and languid expression of the eyes so common to all fevers is well known to the mother of experience. Twitching of the lids and facial muscles in connection with fevers and abdominal suffering is often indicative of threatening convulsions. Affections of the respiratory organs are expressed by unusual shortness of breath, difficulty of breathing and dilation of the alae nasi, even though there be no audible unnatural sounds or cough. Puffiness of the eyelids, with waxy appearance of the skin, will naturally suggest kidney involvement. The teeth will tell their own story of rickets or syphilis; in the latter they are irregular and notched, presenting the saw-tooth appearance of that disease. In rickety children they will be imperfectly developed, usually slow in making their appearance and early to decay. In the latter dyscrasia the forehead is apt to be full and overhanging and the facial features small, the chin narrowing almost to a point, or the lower jaw will be prominently developed and the upper part of the face sunken. The tuberculous child will present unusual brightness of eye and delicate features and have hair fine and silky. Idiocy early shows itself by blank expression of the face, and choreic twitchings and blinkings will tell their own story of nerve impairment. In many of the throat ailments of young children marked difficulty in swallowing and enlargement of the glands of the neck and throat will naturally suggest trouble in that locality. Enormous distension of the abdomen is an additional symptom of rickets, as the "pot-belly" child, whose abdomen is distended out of proportion to the lack of general osseous and muscular growth. The pigeon-chest, prominent ribs and high collar bones of rickets bring imperfect lung development and function, coincident with other typical manifestations, all confirmatory evidences of a bad start in life. Exceedingly severe nervous disturbances, even to convulsions and idiocy, are directly traceable in individual instances to adherent foreskin or a hooded clitoris. So that the most careful investigation that can be made in any of the nervous diseases of children will be imperfect unless the genital organs are examined.

These citations are sufficient to show the importance of careful investigation of sick infants. Pop-call visits are the cause of much carelessness in practice among children whose ailments later show to be of such seriousness as to have deserved a most thorough initial investigation; examination should always be conducted with a view to ascertaining everything that can be learned by careful inspection, often of the naked child.

Pulse.—If possible the pulse of infants and young children, and this applies to adults as well, should be taken during a season of perfect quiet, preferably during sleep. It must be borne in mind that in early infancy the pulse rate is twice, or thereabouts, that of adult life. From birth up to the sixth month it will average from one hundred and forty down to one hundred and twenty per minute; in girl children from ten to twenty beats more. From the sixth to the twelfth month the rate will be from one hundred and ten to one hundred and twenty. During the first three years it will rarely fall below one hundred, and from the third to the fifth it will maintain the rate from ninety to one hundred. From the fifth to the tenth year the heart beat is from eighty to ninety, and after that it declines to pretty nearly manhood rate at the age of puberty. During sleep it is somewhat less than these figures represent, and in states of excitement it is a good deal more rapid. The significance of the pulse in child life applies more to the character of the beat than to its rapidity. Quick, hard, forcible beating is nearly always present in fever, although sometimes the pulse will be rapid and compressible. In scarlet fever it is unusually rapid in the initial stage, and this rapidity does not especially denote proportionate seriousness; while in many other diseases not ordinarily showing unusual rapidity greatly increased action of the heart possesses unusual significance.

Temperature.—The experienced physician will usually prefer to rely upon his sense of touch in taking the temperature of young children. If the thermometer is used, as it should be in all serious illnesses, it will generally do to rely upon its axillary application; or if there be difficulty in inducing the child to remain quiet it may be applied in the fold of the groin. If positive accuracy is desired it may be inserted in the rectum. In children above two or three years of age who are perfectly conscious the thermometer may be trusted in the mouth, but it is safer as a rule to take the temperature per anum. Not only is there danger of the child biting the thermometer, but in most children it is difficult to secure freedom from mouth breathing, and the test is not so likely to be reliable as the rectal test. The thermometric range does not differ a great deal from that of adults, but it is always safe in estimating the record to allow for a variation of a degree or more, depending on the temperament of the child, when the registration is above normal. There is some variation in the time of day, the lowest mark being reached in the evening and before two o'clock in the morning, the highest registration occurring in the middle of the forenoon. This should be remembered, as it differs from the habit in adult life. In acute fevers the addition of a degree of elevation to the adult range in such fevers gives a very clear idea of the significance of the heat; and notwithstanding the fact that the natural temperature in early child-life is lower from seven to

two in the morning, yet continued elevation of the mercury in fever in the early morning at the degree obtained the evening previous is an ominous sign.

The performance of all the functions of the body should always be inquired into carefully. Retention of the feces or urine may be due to imperfect anus or meatus, and neglect to overcome the same promptly may result in serious trouble and even death. Nasal stenosis will be manifested by cyanosis and impediment of the respiration, which will be shown by difficult breathing and by imperfect oxygenation of the blood. Hare lip and cleft palate may make feeding extremely difficult, and so simple a deformity as tongue-tie, or contracted lingual frenum, will sometimes cause the child a great deal of inconvenience in nursing, and its failure to properly empty the breasts may induce mastitis in the mother with consequent harm to the child.

Physiological Hints.—While it is not considered necessary to enter into extended consideration of fetal and infantile development of children, yet there are a few essential points connected with the growth of the human species in early life that should be understood in order to appreciate deviations from the normal.

Prior to birth the fetus is sustained by receiving its nourishment from the maternal blood, by means of the placenta during the last seven months of intra-uterine life, and it is one of the peculiar facts in connection with infancy that in this period of human existence disease prevailing in the mother may be communicated to the child. Not only may it partake of dyscrasie common to the mother, but should she suffer from rheumatism while pregnant endocarditis may be inflicted upon the unborn infant, valvular lesions or malformation or imperfect development of the cardiac organ, leading to its early death. Small pox may pit the child, and it is not altogether uncommon for abortious or premature birth to give evidence of the communicability from the mother to the child of any of a number of diseases. But it should be remembered that after all this is not very wonderful, for until born into the world and separated from her her offspring is really a part of the mother, living within her, being nourished and sustained by her, and, by means of the placental attachment to the uterus, being really a part of her anatomy for the time.

Respiration.—When forced into the world by the act of labor the infant is compelled to depend upon its own resources to a certain extent. It must breathe for itself; it must oxygenize its own blood; it must perform its own scavenger work. Up to this time its mother has done all this for it. Its respiration has been carried on by means of the placenta. This has not been attended by the same degree of oxygenation that is to occur from now on, however, for not having had to maintain a separate existence it has

not needed the oxygen it will now require. And just here a practical thought; New born infants are not always to be pronounced fatally asphyxiated if they do not breathe at once; not having required the same amount of oxygen during intra-uterine life that is necessary to separate existence, they are capable of resisting a degree of oxygen-starvation that could not be borne later, and have been known to live a good many minutes without being sustained by the maternal blood and without having yet "breathed the breath of life" for themselves. The obstetrician very properly tells us never to separate the child from the mother by dissection of the cord as long as healthy pulsations continue therein. This rule should always apply until breathing is properly established, and no better means of resuscitating the asphyxiated new-born is known than to allow the circulation of blood in the body to continue from the mother through the cord until such time as it shall be able to perform respiration. Of course it is necessary to know that the attachment of the placenta to the uterus has not been severed. The pulsation of the cord will be sufficient to determine this point.

Once the child has been separated from the mother its respirations should commence immediately; in fact, prior to its being separated. In vigorous children they will number about forty-four per minute, or just twice the adult record. The breathing should be easily performed, and if blueness of the skin or excessive pallor shall have been present, with the proper performance of respiration a healthy glow should at once show itself. If the breathing is hoarse it would go to indicate too low a temperature of the room and the child should be made warm at once. If it be difficult and attended by the rattling of mucus in the child's throat, this should be gently removed by inserting the finger, covered with soft lint, in the mouth and throat. By this procedure long strings of mucous secretion will sometimes be brought from the mouth and throat and difficulty of breathing from this cause will be at once overcome.

It should be remembered that the breathing of infants is largely abdominal and that no considerable mobility of the chest walls is practiced; hence efforts at artificial breathing by pressure should largely be directed to the upper part of the abdomen and lower part of the chest.

Weight.—The new-born infant weighs on an average about seven and a half pounds, but children may be perfectly well developed and live and weigh much less, even down to four or five pounds; but the smaller the child the more delicate, usually, and the more likely to meet with disaster during the first few weeks of life. Family physique must be taken into consideration in estimating the infant's chances of life and health, the child of small parents usually being small, that of large parents being larger.

It is not at all uncommon for a child to weigh from nine to twelve pounds at the time of birth, and individual instances are on record where the scales have shown a new-born child to weigh as high as twenty pounds. The average length of an infant at the time of birth is about eighteen inches, but there is considerable variation here as in



FIG. NO. I.

TWELVE MONTHS' WEIGHT-CHART.

tions of the body. After the first week the child shows some increase in weight, and during the first six months of its life grows very rapidly. It is not at all uncommon for it to double in weight during the first six months, after which its growth is considerably slower.

Sight and Hearing.—Sight is present from birth, but so far as can be ascertained the infant is only able to distinguish light from darkness. It is generally some days before there will be co-ordination and qualitative vision. It is highly interesting to observe the development of visual power in infancy, and to note the development, stage by stage, of accommodative action of the ocular organs.

the matter of weight. The vigor of an infant is better determined by its strength and muscular resisting ability than by its size. During the first week of life there is some falling off in weight, this amounting from several ounces to a pound or more in individual instances, and being due to the waste of tissues incident to the first performance of efforts at breathing and the carrying on of the necessary func-

The function of hearing is more perfect, and it is not difficult to determine the existence of normal hearing apparatus. It should be a part of the physician's duty to test for hearing in all newly-born children coming under his care. This can be done by snapping the fingers, or making any sharp, quick sound within reasonably close proximity to the ear, and observing the effect upon the infant.

Stomach.—It is well to remember that the stomach of a newly born infant is very small. It is capable of holding less than two fluid ounces during the first week or two of life, and its dimensions are not very rapidly increased. By the third month it is capable of accommodating four or five ounces, and by the end of the first year, from nine to ten ounces. It is highly important that attention should be given to this organ, as a great many infants suffer and die from overfeeding. It is naturally difficult to ascertain the quantity of breast milk taken in the act of nursing, and the physician will have to depend upon the subsequent actions of the baby in determining whether too much or too little is supplied. An ordinary milking should extend over a period of from twenty to thirty minutes, with numerous intermissions between the sucking acts. If satisfied and not overfed the infant will generally immediately go to sleep and rest for an hour or more, sometimes two or three hours, the early part of its life being almost wholly spent in feeding and sleeping. It is doubted whether it is best to allow infants to nurse to satiety. If the stomach is well filled with fresh milk from the mother, or with other food, there will be regurgitation of a portion of the food within half an hour or so after it has been taken, showing inability on the part of the stomach to accommodate itself to so large a quantity because of the increase in cubic area arising from gastric fermentation. Should the food have to be administered from the bottle it is better to limit it to perhaps three-fourths the stomach capacity, as there is at least an increase of one-third in the cubic dimensions of the milk taken, through the fermentative process. During the first weeks of infant life the gastric juice is not possessed of full digestive power, and as a result the stomach is soon exhausted and needs rest, much more than is usually given it, between feedings.

If these thoughts be borne in mind and infant feeding be directed accordingly very much infantile suffering, many sleepless nights, and great maternal annoyance will be avoided.

Intestinal Canal.—As with the gastric juices so with the intestinal juices. They are feeble in their digestive powers during the first few months of child-life, nature having provided a very simple food for the sustenance of the infant, which is largely available by absorption rather than by digestion; hence it is quite necessary to exercise very great caution in taking the newly born babe from the breast and attempting to substitute other food for the

maternal diet. Cow's milk is most often selected in case nursing is impossible, and because of this feebleness of the digestive powers of the stomach and the digestive juices, curds of cow's milk will withstand their action all the way through the intestinal canal, producing more or less irritation in passing and thus serving as a frequent mechanical cause of colic, indigestion, diarrhea and inflammation of the alimentary tract.

Bile is secreted quite early in fetal life, about the third or fourth month, and the meconium which is passed in the first few days after birth is largely composed of it, consisting of a dark brown or brownish-green mass, made up of tenacious mucus and intestinal debris. It is generally several days after birth before the intestines will have emptied themselves of their contents and the stools be given their normal bright yellow color. Sometimes the meconium is passed in the act of labor and the normal healthy appearance will be given fecal discharges within a day or two after birth. It is not until dentition has been well established that the stools assume the form and appearance belonging to adult evacuations, generally not until after the temporary teeth have been erupted. There may be great variety in the character and consistency of infantile intestinal discharges. These will be described under their various headings in the clinical department, as diarrhea, dysentery and entero-colitis.

Urine.—Normal urination occurs from eight to ten times daily during the first few weeks of infancy, the quantity averaging about an ounce. It is much more likely to be less than more than this, and it is not at all uncommon for an infant to go several hours without wetting the diaper. The physician should always ascertain the absence of mechanical obstruction of the urethra within twenty-four hours after the child's birth. It will not do to rely upon the nurse's negative testimony in regard to the action of the bladder. The urine is so clear and limpid that it does not always stain the diaper, and if the quantity be small and considerable time passes between each urination it may never be found wet, the report being that the kidneys have not acted. It will be better to carefully examine the diaper by inspection and olfaction than to accept a negative report and institute unnecessary physical examinations. Serious inconvenience may arise if this function is not properly performed, and it is not uncommon to find it necessary to remove smegma from the meatus or dilate or amputate the prepuce in order to relieve a distended bladder. It is sufficient to suggest that personal inspection and individual attention shall be given to every case in which the urine is not passed naturally during the first day of baby life. As time advances longer intervals pass between micturitions, the quantity increases with each act and the urine imparts stronger odor and has greater specific gravity than in the first few weeks of child-life. At first clear and limpid,

with a specific gravity of 1003 to 1006, with slightly acid reaction, it acquires a lower specific gravity, increases in quantity, becomes possessed of stronger odor, and takes on alkaline reaction.

Crying.—There is a good deal of clinical significance attendant upon the crying of young children. Naturally this is their only means of expressing their complaints and discomforts. It may be stated that the perfectly healthy child ought not to cry at all, or only when inconvenienced by hunger or uncomfortable position; but there is such great variety of temperaments and dispositions in children that it is not necessarily an evidence of distress or illness with some children if they cry a great deal. Constant crying, crying every minute of the time while awake, falling asleep with exhaustion only to cry again upon awakening, are indicative of pain and belong either to *catache* or *gastralgia*. If from hunger, the application of the breast or bottle will diagnose the case. If the child be suffering *catache* or other pain, it may find solace for a minute or two in the bottle but the relief is exceedingly temporary. The crying of *colic* or *enteralgia* occurs in paroxysms and is accompanied by flatulence or distension of the belly, drawing of the limbs, coldness of the hands and feet and positive evidences of severe distress. The *colicky* cry of some children is pitiful. Brain cry, the cry of *hydrencephaloid*, is sudden, sharp, piercing and paroxysmal. The *pneumonia* cry will accompany cough, and as the cough is painful, so will the cry be sharp and distressing. In severe cases of lung trouble the child will resist coughing and do its best to keep quiet because of the pain resulting from the cough excited by the cry. A hoarse cry is apt to attend continued crying spells, and is not then significant; but if a child, otherwise well and not usually a crying child, awakens with hoarse crying it is very apt to betoken the oncoming of croup or laryngeal inflammation.

Diagnostic Hints.—There are certain facts in connection with the investigation of infantile diseases that are necessary to the physician for intelligent prescribing, and the development of these from the child, its nurse and parents is of a matter of no little difficulty. Its hygienic surroundings, the general state of its health, and its present physical appearances reveal themselves at once to the careful observer; but the securing of the pre-natal history, a matter of very great importance, oftentimes requires a good deal of finesse. It is essential in nearly all diseases of childhood for correct and successful prescribing to know whether there is a tuberculous history back of the child, whether intimately associated or remotely removed, on either parental side. In their love, fear and sympathy parents are not always willing to admit the existence of tuberculosis in their genealogy, for even people ordinarily well informed understand the underlying influences of tuberculosis in relation to the diseases of children. It is necessary

therefore, that direct interrogation be persisted in and be made to cover a wide field; not only must the immediate parentage of the child, but its aunts, uncles, grandparents and cousins, all be considered in the inquiry. Especially should the physician weigh evidences of chronic cough, chronic diarrhoea, or general ill-health of either parent or other immediate relative. Many skin diseases are of tubercular character, and the presence of any of these in grandparent or other kin may have important bearing upon the illness under consideration. Inquiries in regard to syphilis as a predisposing cause of ill-health in infant life will almost invariably be limited to the paternal parent. Naturally most men shrink from the thought of the sins of their early life being visited upon their children, and it is generally difficult to get admissions in this direction. It is well just here to caution the beginner that inquiry in this relation will have to be directed with great care, the simple suggestion of parental responsibility often resulting in the dismissal of the physician from the care of the case. He may have to rely wholly upon his knowledge of the syphilides, the syphilitic teeth, the syphilitic cranium and the general syphilitic state of infant life, avoiding direct questioning, or touching upon the subject lightly, or apparently indifferently, as the case is being reviewed. It should not be forgotten in this connection that while inquiry is generally directed alone to the paternal side, the mother may be responsible for the child's condition. Constitutional syphilis may have come from her parents, or she may have been previously married and have contracted it from her former husband. Again, cases are on record in which women have contracted syphilis before marriage. These facts must not be forgotten, but inquiries in this regard will have to be pursued with great caution lest the best interests of the infant, and the physician's interests, be made to suffer because of over-blunt questioning. The history of the child at birth is important, and the history of the mother for some months prior to its birth has its bearings also; if it was prematurely born it is well to know the reason, and to ascertain the state of its vitality for the first few months of its life. Its habit of feeding should be inquired into, whether this be vigorous, as though enjoying good digestive powers, or whether from early infancy it has been dyspeptic. The habit of its intestinal tract, as refers to diarrhoea and constipation, frequency of stool, colour, character, odour and time of occurrence of the same are important. The sleeping habits, and its mental disposition, as of peevishness or happiness, its general physical condition as to nervousness and sensitiveness, should all be taken into consideration. If it has already reached the teething period it will be well to know when its first teeth were erupted, what troubles seemed to arise therefrom and whether the process was normal, and what its general condition throughout the teething period has been. If old enough

to walk, or at the age at which children should walk, inquiry must be directed in this respect with reference to ascertaining its general strength and the condition of its bony system. In infant atrophy it is important to know whether efforts were made at abortion when the child was started on its way, and if so what drugs and other means were used in this relation. Look to the condition of the child's digestive apparatus. Does it nurse well? Does it digest its food well? Does it evidence suffering and distress in this relation, is it colicky, is it troubled with flatulence, and, if so, is this very offensive? Does it vomit? Does it rest sweetly after feeding? All these questions are important and serve to good purpose in directing prescriptions.

Inquiry will have to be made in regard to the mother's habits, if she is nursing her child. Is she constipated, or the subject of diarrhea? Is she dyspeptic? What is the character of her food, and what are her cravings, her mental disposition, her general physical health and her habits as to sleeping, and what were they during the pre-natal life of her child? Does she use coffee to excess? If so, her child is likely to be colicky and wakeful and unhappy. The same condition obtains from the free use of tea. Is she a sufferer from headache, either nervous or sick headache? Is she vehement, irritable, at sword's points with the world, her husband and herself? If she be mentally or physically unwell or out of sorts the child may best be treated through the mother's milk, by medicating her instead of the baby.

Enough has been said along this line to suggest the necessity of inquiring into the minutest details of the baby's habits, history and surroundings. Careless prescribing in infant illness is never justifiable. Thoroughness of investigation affords the best basis for correct selection of remedies. Therefore the necessity for the greatest care and thoroughness in making the examination of infants entrusted to us. In diarrhetic states it is not sufficient to rely upon the nurse's description of the stool. They should be examined by the physician. He will want to know their consistency, color, odor, chemical reaction, general composition and character, facts that can only be ascertained by personal examination. The "little grains of tallow" that suggest *Thiophorus* are often spoken of by the nurse as particles of curdled milk, or as food in part undigested. The shade of green is important in selecting the remedy, as to whether it is the *Chamomilla*, *Ipecac* or *carbonate of magnesia* green. Personal inspection of the constipated stool will often determine as to whether the remedy is *Bryonia*, *Opium*, *Alumina*, *Plumbum* or *Collinsonia*, while examination of the child with reference to times of recurrence and its conduct during, before and after stool, is also necessary in order to correctly apply the remedy. A simple illustration will suffice. *Gummi gutti* is the single remedy that is characterized especially by the

expression of complete relief upon the forcible passage of stool. Here it is not enough to know the color of the discharge, but the conduct of the child as to pain preceding and relief following will more clearly determine the selection of the remedy than the stool itself. It is important to observe the aggravations. If after eating or nursing stool occurs almost immediately, *China* and *Arsenicum* will be invariably thought of, without much relation to the character of the discharge. Relaxation of the anus will more clearly call for *Apo* or *Phosphorus*, especially the latter, than the character of the stool; yet if with this relaxation the stool is watery and specked with the 'tallow grains' the combination will be in favor of the latter remedy. The odor of the stool is often important, and here again the physician should depend upon himself. If exceedingly sour, *Rhœum* is quite likely to be called for, without special reference to the character of the stool, although *Sulphur*, *Hepar* and *Colocynthis* also have sourness of stool. With *Rhœum* the whole child smells sour, so that, to illustrate, it may be necessary to notice not only the odor of the stool itself, but of the infant, its breath, its perspiration, its urine. In excessive putridity of stool *Psorinum* and *Chamomilla* are to be thought of, the odor being that of rotten eggs or sulphuretted hydrogen. Here the physical state of the infant will have to differentiate between the remedies. The *Psorinum* child is old, withered, prostrated and wan. The *Chamomilla* child is an acute case; has colicky pains, crying, restlessness, wants to be carried, and the diarrhea is greenish or yellowish-green, while that of the *Psorinum* is dark brown.

Perhaps more inconvenience is caused to the parents and nurse by the sleeplessness of young children than any other condition. In making inquiry into this state it is necessary for correct prescribing to know the pre-natal habit of the mother. Was she wakeful while carrying the child? If so, these symptoms will be more difficult to manage. Proscribe her tea and coffee. Is she wakeful and of extreme nervous disposition? In prosecuting the investigation in reference to the infant it is desirable to know at what times it sleeps most sweetly and when it is most wakeful and restless. It is desirable, also, to know whether this restlessness is from the pain of indigestion or from habit, formed by frequent nightly feeding and attention on the part of the mother or nurse, and encouraged by its surroundings, as by the burning of a light in the night. Attention to little things is exceedingly important in connection with many of the ailments of infants. Dyspeptic colic is usually worse at night, and a little extra care in the hours of feeding and in the quantity given will often secure to the child its natural rest. The source of suffering of young infants is sometimes very difficult of ascertainment, and yet of first importance for correct prescribing. Many a child has been treated for colic who was suffering from carache or neuralgia. In cases of

severe or persistent crying the ears should have careful examination. If acute inflammation is present with suppuration threatening there will usually be odor from the affected ear. Lifting the ear upward and backward or pressing upon the tragus will increase the pain. Earache is also almost always intensified by the motions necessary to the act of nursing. The child will draw a time or two and then stop and cry, throwing its head backward or from side to side. The colicky pain is generally relieved by nursing, only to be intensified later, while the earache pain is caused by motion of the jaws and throat and occurs simultaneously with that act. Fever is almost always present with inflammatory disease of the ear, while rarely so with colic. Sudden piercing, screaming cries of the infant belong to the hydrocephaloid state of acute inflammation of the brain meninges. Children crying out suddenly in the night are usually sufferers from chronic infantile dyspepsia, the case partaking of the character of nightly terror, which is also caused in many instances by ascarides or threadworms. The child awakens terrified, screaming or crying viciously, quieting upon being taken in the arms and securely held for a time, its conduct being that of fright rather than of pain or distress. If from the former, *Nux*, *Lycopodium*, *Pulsatilla*, *Stramonium* or *Cina* may be needed, while if the character is that of distress and suffering *Colocynthis*, *Magnolia phosphorica*, *Chamomilla*, *Veratrum* and *Belladonna* may be required. If the state be purely nervous, *Ignatia*, *Pulsatilla*, *Aconite*, *Nux vomica*, *Coffea* or *Moschus* may be called for.

These suggestions of remedies are made to illustrate to the student and beginning practitioner the necessity of painstaking examination in infancy, with reference not only to the diagnosis of the case in hand, but with reference to the selection of the indicated remedy. There are pain and pain; suffering and suffering; diarrhea and diarrhea; constipation and constipation, as these disorders relate to the remedies necessary for their cure; and it is not enough to know in a general way that the child is restless, is suddenly startled or suffers pain. The more specific the inquiry, the more thorough the investigation of the disease, according to the methods of Hahnemann, the more successful will the physician be in the selection of the remedies.

Especially important are times of aggravations, conditions of the alimentary tract and the state of the cerebro-spinal nervous system. Haphazard prescribing fills graveyards. Careful and conscientious differentiation of remedies in the diseases of infancy saves much suffering and many lives.

CHAPTER II.

INFANT FEEDING.

General Considerations—Wet Nurse—Animal Milks—Cow's Milk—Peptonised Milk—Condensed Milk—Proprietary Foods—Lactose—Beef Foods—Domestic Foods—Sterilisation—Pasteurisation—Weaning—Conclusions.

General Considerations.—The natural food of infancy is the mother's milk. It is believed that there is no more certain fact known in connection with infantile mortality than that fully seventy-five per cent of deaths occurring during the first year of child-life are among infants fed artificially. The natural debility of the gastric and intestinal juices accounts in great part for this high mortality rate. The muscular digestive apparatus may be sufficiently strong and vigorous to perform its part of the digestive act perfectly, but it must be remembered that chemistry plays a most important part in the digestion of food, and since nature has undertaken to furnish only such strengths and characters of ferments as will take care of the maternal milk it is easy to understand how all sorts of disturbances of the digestive organs, and consequently of the general system, may arise from introduction of food of such constituency as cannot be successfully acted upon by the digestive secretions of the infant. According to Miège's human milk is composed, in the early weeks of infancy, of a fraction less than ninety per cent of water, and a fraction more than ten per cent of solids. Of the solids casein is present in the proportion of 1.665; albumen, .700; fat, 3.45; sugar, 3.274; salts, 0.446. Cow's milk, which is so often substituted, many times upon the most flimsy excuse, for the mother's milk, contains a fraction more than eighty-seven per cent of water, and a trifle less than thirteen per cent of solids. These solids consist of casein, 3.222; butter, 4.209; sugar, 5; salts, .527. It will be noticed that the difference in the composition of the human and cow's milk is not after all so great so far as the relative proportions of water and solids go; but it will also be noticed that the great difference in the composition of the solids lies in the direction of casein and sugar. Maternal milk has 1.665 of casein as against 3.222 in the milk of the cow, and of sugar the mother gives 3.224 as against an even five per cent for the cow's milk. In the later months of the nursing period the differences are not so great, but, as will have been seen, in the early months of child-life the infant will have to handle fully twice the quantity of casein and nearly twice as much sugar if cow's milk be substituted for the natural diet.

Again, not only are these differences marked in the relative quantity of casein and sugar, but there is a very great difference in the density of the casein and the general constituents of the milk. During the first few days the secretion from the mother's breast, called colostrum, contains less sugar, more salts and a larger quantity of albumen, and is of higher specific gravity than the milk supplied by her later. This colostrum is not a pure type of milk, but it is well adapted to the necessities of the young child for the purposes of clearing away the meconium. Nature has evidently attempted to suit it to the first needs of the baby and the first possibilities of its digestive organs. Human milk is much more slowly curdled than cow's milk, and a flocculent precipitate is formed which is steadily dissolved by the infant gastric juice. In cow's milk the casein is precipitated in lumps which gather together in tough curds, and even though diluted or rendered alkaline it is badly curdled by the action of the gastric juice.

In quantity an infantile meal is supposed to consist of about two ounces. As suggested in treating of the functions of the stomach, it is believed the quantity administered at each nursing should fall short of the capacity of that organ. The young babe will require nourishment at intervals of about two or two and a half hours during the first few weeks of its life, from early morning until late at night, and one or two nursings through the night. It should be allowed to nurse from twenty to thirty minutes, to nurse awhile and rest awhile, until its meal time is completely covered. A little care in starting the baby off in life, with regular nursing hours, with reasonable limit as to time and quantity, will be much better for its health and will at the same time make its care much more of a pleasure and much less of a burden to its mother. It is better to feed by the clock than to be governed simply by baby's uneasiness, which is often not at all an evidence of hunger. It is quite surprising how simple the care of a child may be made if regularity as to feeding, sleeping and defecation be insisted upon during the earlier part of its life.

After a few weeks the interval between feedings may be lengthened and the child may be allowed a longer nursing seance. By the third or fourth month nursing once in three hours will be often enough to feed it, and by the end of the sixth month from three to four hours will be a proper interval between meals. Of course, there will be variability to suit individual cases; but frequent feeding and overfeeding are far more prolific causes of distress and disease in infant life than is generally recognized. Mixed feeding may be begun with perfectly healthy children about the sixth month. They are by this time able to digest cow's milk if they are well and the season be favorable. Should the hot season be coming on or already on it will be very much safer to

depend wholly on the mother's milk than to attempt a mixed diet. By the eighth month it is usually safe to allow children the simpler articles from the table, if their digestive organs are in good condition and the teething process be well advanced.

Wet Nurse.—When for any reason the mother is not able to nurse her child it is decidedly safer to substitute the milk of another woman than to resort to cow's milk or artificial foods. In fact, it is not at all infrequent that it is better to secure the services of a wet nurse than to rely upon the maternal breast. If, for instance, the mother is of tubercular habit she should be spared the tax upon her vitality necessary to nursing, and this rule applies also to all constitutional diseases. It sometimes becomes necessary because of excoriated nipples or broken breasts to relieve the mother of the suffering of nursing her young, and, besides, it is not wholesome for the infant to nurse from a sore nipple or mastitic gland.

Should it become necessary to employ a wet nurse a young woman should be chosen by preference. She should, of course, be healthy and free from local or constitutional disease. She should also be of good disposition, since the nourishing properties of milk and its digestibility are materially influenced by temperament and disposition. A nurse should be selected whose child is near the age of the infant for whose services she may be required. The strictly professional wet nurse of the city who keeps up her supply of milk by continued nursing of successive infants for the money there is in it is an abomination. It is not best for the health of the child to have a difference of more than three or four months at most between its own age and that of the offspring of the nurse, nor is it best to have a nurse older than the mother of the infant to be nursed.

Naturally a great deal of annoyance arises from the presence of a wet nurse in the family. If she be not properly-dispositioned she is very likely to over-estimate the importance of her services in a given case and cause a great deal of embarrassment in the household. Such a woman is not fit by temperament to nurse a young infant, and repeated trials may have to be made of different women before the bright, cheerful, willing disposition, possessed of the necessary physical requirements, will be found. But if the necessities of the helpless infant be taken into consideration efforts will be persevered in, even to borrowing the services of neighbors who may be suckling their young until the little charge will have been carried over a few months, or a few weeks at least, of its life. I have witnessed the sacrifice of more than one child to indifferent efforts at the securing of a wet nurse, and it is hardly possible to too strongly impress upon the mind of the physician the greater desirability of finding the right woman than of resorting too early to cow's milk or other non-human food.

Animal Milks.—Next to human milk that of other mammalia is most likely to meet the requirements of the nursing infant. Clinically I have found jennet's milk to be better than any other for the first few weeks of infant life. It is not always easily obtained, but the jennet is so gentle and easy going and her diet is so simple that her milk has been found to be as non-irritating and easy of digestion and assimilation as any that can be employed.

For some reason sheep's milk has not been called into the requisition that might be expected. It is so easy to obtain this animal and to care for it, and its milk is so comparatively free from casein, that it would seem that it ought to be almost the ideal artificial food. I have known of instances where a ewe has served most excellent purposes in the country, and confess to the conviction that the milk of this animal ought to be used more than it is.

Goat's milk is highly recommended by some authors. I have had but little experience with it, but in sturdy children several months old have found it to serve an excellent purpose. In younger children it is too irritating, being too rich in casein, especially. If the milk of a goat is relied upon its food should be selected for it.

It ought to go without saying that in choosing any animal for nursing purposes it should be a young animal, perfectly docile and thoroughly healthy. No chances should be taken of the communication of tubercular or other disease through this means.

Cow's Milk is used more extensively and generally than the milk of all other animals combined, and the raising of infants upon bovine milk is deserving of rather more careful consideration than is usually given to the subject.

As has already been noted, the cardinal difference between cow's milk and human milk lies in the quantity of casein. This element is closely akin to albumen in its nature, and when present in a liquid in small quantity its coagulation takes place simply in the form of a fine cloud or coalescence, while if the quantity be larger it coagulates in curds. There is also some difference in the character of the casein present in the two kinds of milk, and it is, beyond question, the indigestibility of the casein of bovine milk that interferes with its perfect adaptability to the necessities of infant feeding. Careful analysis of cow's milk shows that it contains a larger amount of ash, less of sugar, a much greater amount of casein, and about the same proportions of fat and water as are found to belong to human milk. Some authors have undertaken to overcome the objection arising from the presence of the greater quantity of casein in cow's milk by giving it diluted; but it must be perfectly clear to the understanding that no matter how much water be added to milk the quantity of casein in proportion to the quantity of solids remains the same. As a matter of fact water has no influence whatever upon bovine casein. It does not make it

more soluble, nor less coagulable. The only advantage that can arise from diluting the milk lies in the fact that a lesser quantity of crude milk is taken, and that the total amount of solids in proportion to the entire amount of food is decreased, the relative proportions of the solid elements remaining the same. The child simply gets more water and less of the substantial elements of milk. There is no doubt that it is better that the quantity of solids should be decreased when they are not of a character to be taken care of by the system. Ninety-five per cent of water and five per cent of solids are preferable to ninety per cent of water and ten per cent of solids, if the latter be difficult of digestion; but except for this advantage nothing is to be gained by diluting cow's milk. Some authors prefer to prescribe the pure article, undiluted; but it is plain that with a given quantity of straight milk there will be more indigestible substance, and consequently more of irritation and disturbance of the digestive organs, than if this quantity be reduced one-half by adding plain water to supply the difference. The whole object to be obtained in case cow's milk is to be used is to try to make the distribution of solids as nearly as possible like unto that of the mother's milk.

According to Miège the best possible preparation of cow's milk is that the basis of which is cream. He holds that the first essential is to render the milk as alkaline as human milk is. His next step is to dilute with water so as to get the quantity of casein reduced to about what it would be in maternal milk. Then the fat and sugar are increased as necessary by the addition of cream and sugar of milk. The method Miège recommends in the preparation of this food is one which I have followed for a good many years, and which I have found to be very satisfactory indeed. To one pint of sterilized water seventeen and three-fourths drachms of pure commercial sugar of milk are added and dissolved. This sugar-water must be kept in a cool place and not allowed to sour. When feeding time arrives two table-spoonfuls of cream, one of milk, two of lime-water, and three of the milk-sugar water are mixed, and as soon as this mixture has been warmed to proper temperature it may be poured into the bottle and the food is ready for use. In the earlier weeks of its life the infant should be given this food in exactly the quantity and frequency belonging to the natural feeding. Later the quantity of ingredients named, cream, milk, lime-water, and sugar-water, may be doubled, and the quantity subsequently increased as the necessities of the child demand.

It is highly important that milk-sugar be used instead of cane- or grape-sugar. It is not necessary to enter into the chemistry of the different sugars in this connection, but it suffices to proclaim with emphasis the significant fact that the differences are so very great, and the difference in their effect upon the infantile system so

positive that table sugars should never be used in the preparation of artificial food.

Cow's milk varies so much that it is difficult to properly estimate its value as a food for nursing infants. It is a well-known domestic fact that milk possesses varying degrees of "richness." The milk of some cows is pale, bluish, and almost altogether free from butter-making elements, while milk from other cattle, the Alderney and Jersey especially, is so plentifully supplied with fat and oil as to be rich in butter-making possibilities. The quantity of casein differs also, and perhaps the most serious mistake made in attempting to bring up infants on cow's milk is in selecting milk because of its known richness. It is a mistake to choose the milk of butter-making cattle. In the absence of any better test the sight, taste and odoration of the physician or mother should be brought into requisition in choosing milk to be fed the baby. It should be as nearly like the maternal milk as possible in color, odor and taste, and in order to secure this degree of resemblance the blindest, thinnest, and poorest of healthy cow's milk that can be obtained should be employed; and even this will often be found to be richer and heavier in solids than the mother's milk. If cow's milk is chosen it should be as fresh as possible. In cities it is difficult to get it absolutely fresh, and it will be found to be better to resort to other foods than to accept the heated, churned, jolted mixed-milk of the street milk vendor. If a cow is being kept, or if a neighbor's cow is being called upon, care should be exercised that its food be pure and wholesome and absolutely free from swill and brewery refuse. It should be given the purest of water, and its stall should be kept perfectly clean. The animal should not be allowed to be fretted or worried from any cause, and its calf should correspond as nearly as possible in age with the child who is depending upon its milk for sustenance. The more quiet and docile the animal the better for the child. If milk is to be given undiluted and unprepared it should be obtained fresh several times a day in quantities to suit the child's necessities. If the Miège's method is to be pursued this is not only not necessary but will not answer, since it is essential to use cream in preparing the food. It should be borne in mind that the food of the cow supplying milk should be well salted, and less firm coagula will form in the child's stomach if a little pinch of table salt be added to its meal.

If it be attempted to bring up baby on the milk of one cow it should not be forgotten that it is as much an element of health in cattle as in human life that sunlight, outdoor air and exercise shall be a part of their daily hygiene. So different is the milk of cattle allowed to roam the meadows and those stall-kept that the reaction of the former is always alkaline, presumably from muscular activity and consequent elimination of the various salts of the body in its secretions, the milk showing its full share, while the

milk of cattle that are stall-kept is almost invariably acid in its reaction. This necessity for exercise adds to the difficulties of securing milk from one cow; yet in spite of all this I am firmly convinced from very careful personal observation that where the proper keeping of a single cow is possible it is much better to rely upon its milk than upon a mixture from a number of cattle. Some authors argue that because it is possible for a single cow to occasionally show some slight ailment it is safer to get milk from a dairyman who supplies it from a number of cattle. It seems to me this argument is fallacious, as there is greater probability of having the milk of a dozen cows contaminated from one not in perfect health than there is of suffering from the contamination of the milk of a single cow kept under close observation.

Peptonized Milk.—Within the last few years efforts have been directed toward the discovery of some process whereby the indigestibility of the curd of cow's milk may be overcome outside of the stomach, and as a result we have the process known as peptonizing, by which the casein is converted into soluble peptones, just as the albuminoids of beef are converted into peptones in the process resulting in the manufacture of beef peptonoids. This process is accomplished by the addition of peptonizing powders, and that it secures at least the partial digestion of the casein is demonstrable beyond question; but because of the fact that a peculiarly bitter flavor is imparted to milk thus prepared it is often rendered unsuited to infantile uses. In older children in continued fevers, and in many of the diseases of adult life, peptonized milk is a most excellent article of diet; but, unfortunately, it is very distasteful to young children, and, furthermore, I am sure I have witnessed more than one case of diarrhoeal disease as a result of its use in early life. It is almost impossible to so flavor peptonized milk as to make it acceptable to the infant taste. Again, it has been argued, and with reason, that the use of the peptonizing powders results in less active stomach fermentation and consequent greater debility of that organ. To peptonize milk it should be diluted, and an alkali and pancreatic ferments be added and the mixture boiled, in quantities sufficient to last for twenty-four hours. There are a good many peptonizing powders on the market, some of which are very reliable, especially Fairchild Bros. and Foster's, rendering the preparation of this form of food very simple.

Condensed Milk.—Condensed milk has been very extensively used as a baby food. By this is not meant milk as condensed by dairies and delivered in jars and pots for daily use, but the condensed milk of canneries, as the Eagle brand, Anglo-Swiss brand, American-Swiss brand and others; and in spite of the fact that it is known to contain large quantities of cane sugar many children thrive upon it well. With some children it does not

agree, the sugar causing an acid condition of the system and diarrhea. The especial complaint I have to make against it is its remarkably free action upon the kidneys, polyuria being a not infrequent attendant upon its use. But this is simply an annoyance, and should not be allowed to weigh if this food otherwise agrees. Condensed milk is always convenient, and if properly kept is not likely to sour. It contains much less fat than fresh cow's milk, and its casein is much slower to coagulate, not being immediately precipitated in considerable masses. It will often be found a satisfactory substitute for cow's milk, and serves a most excellent purpose when the stomach is disordered and vomiting is present as a common condition.

Should condensed milk be employed it should be obtained fresh, and when once a can is opened it should be kept in a cool place and covered. For this purpose an inverted glass vessel should be placed over the can in water to exclude the air and dust and dirt. The milk should be pearl gray or white in color, never yellow. A common mistake in the use of this food is its excessive use. It should be borne in mind in preparing it that a very small quantity answers the purpose, the best domestic test being a near approach to the mother's milk in color, density, taste and odor. The common instruction is to prepare this milk in proportion to a teaspoonful of it to two table-spoonfuls of water. In my experience this is altogether too great a proportion of milk. For babies from a few days to a few weeks old a small teaspoonful to a quarter of a pint of water will be sufficient. As the child grows older the quantity should be increased. At the proportion first named the amount of sugar in comparison with human milk is about the same. There is less of fat and a slight deficiency in casein, so that the proportions of one part to eighteen of water would seem to be about right; yet clinically I have found young children to do much better when the relative quantity of water is considerably increased. The chief fault of the stronger preparation is diarrhea from the cane sugar.

Condensed milk should always be prepared in cool water. Hot water renders it too syrupy. It should be prepared in water that has been boiled and subsequently cooled, and if necessary to warm it this may be done by placing it under the pillow for night use and by standing it for an instant in a vessel of warm water just before feeding in daytime. I am sure that one of the secrets of success in its use among poor people is their failure to give it warm.

Proprietary Foods.—Efforts to so prepare cow's milk as to humanize it, or render it like unto the mother's milk, have already been spoken of. It is first sterilized by being kept at a temperature of 160° or 170° for an interval of from ten to twenty minutes. Efforts are then made at the proper adjustment of the lactose and the permanent securing of an alkaline reaction, by the addition

of sugar of milk, and the alkaline milk-salts in proper proportions. Cream may be added to supply the proper percentage of fat. Among the various proprietary preparations that are now manufactured that simulate more or less closely the maternal food, the peptogenic milk powder of Fairchild Bros. and Foster is one of the best I have used and in some instances serves an excellent purpose. This powder is added to the proportion of one large measureful, the measure going with the powder in bulk, to one-half pint of water, one-half pint of milk, and four tablespoonfuls of cream. The mixture is brought to boiling point, with constant stirring, for a minute or two, and is thus quickly prepared for use. It is sterile, slightly alkaline and chemically somewhat allied to mother's milk.

A great many chemists have been engaged in recent years in attempts to prepare artificial food for infant and invalid use, and some, no doubt, with the sole idea of accumulating more than their share of this world's goods from their sale, while others, it is believed, are prompted by honest desire to assist in solving the difficult problem of successful artificial feeding. The author is not one of those who stand ready to condemn all the various proprietary foods as absolutely worthless. Grant, even, that those engaged in their manufacture are wholly mercenary, it must yet appear that success cannot very long attend efforts in this direction unless the product possesses some merit; for the severest denunciation of a jealous profession and sorrowful parents will surely follow upon the utter failure of a prescribed food to fulfill its requirements. As a matter of fact I have had some most excellent results with a number of commercial baby foods. Especially satisfactory has been my experience with Mellin's Food. Nestlé's Milk Food has served me well in the early days of infancy, in tiding over sore nipples or broken breasts for a short while only. The Fairchild food previously mentioned is one of the best on the market. Lactated Food and Horlick's Malted Milk are among the good preparations in individual cases. Mellin's Food meets the requirements of baby life as well as any food before the profession. This preparation is a dry powder and consists of soluble carbohydrates, 69.38; albuminoids, 9.75; cellulose, gum, etc., 3.18; salts, 4.37; the soluble carbohydrates are dextrin, 35.92, and maltose, 33.46. It is free from starch and cane sugar and is of the class of infant's foods known as Liebig Foods, and doubtless the best exponent of this class. It is prepared with diluted fresh cow's milk. I have prescribed this food for nearly twenty years, not often with infants under three months of age, but very largely for infants above this age, and have found it a most reliable baby food; its use is a great deal less liable to be attended by derangement of the bowels than is the use of pure cow's milk alone. I have obtained the best results by preparing it with

fresh cow's milk which has been brought nearly to the boiling point (pasteurized milk). Nestle's Food contains 44.88 per cent. soluble carbohydrates (32.93 cane sugar, 6.02 milk sugar), 40.10 starch, 8.23 albuminoids, 1.91 fat, 1.59 ash. These large quantities of starch and cane sugar in an infant's food are objectionable. Ridge's Food has 77.96 starch, 5.19 soluble carbohydrates (sugar, etc.), 9.24 albuminoids, 0.63 fat, 0.60 ash. It will be seen that this food has a very heavy proportion of starch and low proportion of sugar; and it is the presence of this large amount of starch and the difficulty of its transformation into maltose, in order to fit it for assimilation, that excite so many gastro-intestinal disorders in infancy. Consequently there have been many efforts made to supply dextrose or maltose to various proprietary foods in order to assist in their digestion. It is claimed that the conversion of starch artificially or by chemical process into malt sugar relieves the child of that work and thus greatly simplifies the digestive labor without demoralizing that function; it is chiefly because of success in the manufacture of Mellin's Food in accomplishing this work that this particular preparation has been so satisfactory.

Lactose.—The carbohydrate element of adult food, which is chiefly made up of starches and the different varieties of sugar, and constitutes the largest part of most vegetables and fruits, is represented in milk by lactose (milk sugar) only. Its function is to supply heat by oxygenation, and in chemical properties it is isomeric with sucrose or cane sugar. In infant life it is necessary that a greater degree of heat be maintained than in adult life, yet it is not possible to secure this by exercise, and consequently it must come from food.

Lactose is relatively the largest constituent of human milk and by the virtue of the presence of certain bacteria, which act as ferments, a portion of it is decomposed and lactic acid results. The formal change comes about from the separation of a molecule of lactose into four molecules of lactic acid by the addition of one of water; lactic acid in excess will, upon being absorbed into the blood, dissolve out the phosphates already fixed in the body, especially in the bones. In addition to this fermentation in milk, there is a second accompanied by the development of an alkaline reaction by which the curd (casein) becomes dissolved and converted into soluble peptones. Scientific investigators assert that this process is carried on by the presence of certain bacteria, of which there are ten different varieties, and from the changes made two simple ferments are formed, one going like rennet to curdle the milk, and the other possessing a peptonizing action. During the process resulting in the manufacture of this element there are produced other chemical constituents, known as leucin, tyrosin, ammonia and butyric acid. The fermentation belonging to this process is named from the

latter acid, and is due generally to the long continued presence of curds of milk or starch in the intestinal tract. It is the result of a putrefactive process and not a part of normal digestion.

It has been shown that starch is the chief carbo-hydrate of adult food. It is digested by the action of the ptyaline of the saliva and the pancreatic juice, which are not secreted to any great extent in infant life; consequently the infant cannot handle carbo-hydrates in this form. By the action of these fluids starch is converted into maltose and dextrine. Therefore, because of these deficiencies, efforts at the preparation of baby foods should be largely directed toward the conversion of starch into dextrine and maltose before it is given to the infant.

It seems to me that it is needless for the medical profession to decry the value of some of the baby foods at present on the market. What we know of the digestive function has been largely learned through chemistry, and this science has attained such a satisfactory degree of perfection at this time that the chemist is able to equal and even excel the efforts of nature in many directions. He cannot, perhaps, outdo nature at her best; but when the vital forces are disturbed and children are sick and their foods are disagreeing with them, when we are unable to meet the requirements of individual cases, it is far better to avail ourselves by careful study of the knowledge that chemistry gives, and to apply that knowledge to our little patients, than to blindly rely upon the empiricism of domestic feeding. The chemistry of foods should be made a separate study in medical colleges, and the general practitioner should be fully acquainted with the chemical constituents and relative values of all the natural and artificial foods he may have to choose from in individual cases of illness; and not until this knowledge is availed of by the profession will the feeding of infants be more than empiricism.

Beef Foods.—As a rule beef foods are not permissible in young subjects. They are rich in salts and fats and feeble in sugar, and too strong and irritating in their chemical properties. Furthermore, intestinal parasites, especially the tenia, are introduced into the infant system in beef juices. In the later months of the nursing period if the child is not properly nourished on milk or the selected artificial food, the use of rare beef gravy or a weak dilution of Valentine's beef juice or bovineine is permissible. Sometimes children of several months of age will thrive nicely by chewing or sucking chunks of rare, tough beef, from which they get the juice and not the fibre, or on equal parts of bovineine and milk. I have, however, traced so many cases of saginata to the use of rare beef juice in infant life that I am slow to recommend it.

Domestic Foods.—There are a great many domestic preparations that are valuable as baby foods; as, for instance, the old fashioned flour-ball, which is made by pressing a ball of flour in

two or three thicknesses of cheese-cloth and boiling it two or three hours until it is hard and dry; this is crumbled and dissolved in freshly boiled water to which a little cream is added, when it is ready for use. Barley water, arrowroot gruel, rice-water, whipped egg, parched rice-mush, toast-coffee-water and numerous other preparations have been found useful in individual instances. Their use is largely empiric and clinical. The best of all these in my judgment, especially if there is any tendency to diarrhea, is barley water. If the habit is one of constipation, and if eczema is not already present, oatmeal water mixed with an equal part of milk, a little cream being added, makes a good baby food.

Barley water is best prepared by cracking or grinding a teaspoonful of selected pearl barley in a coffee mill, putting in one half pint of water, boiling and adding its bulk of Pasteurized milk or pure water. It may be desirable in special cases to add a few drops of bovine to this preparation. Another method of preparing barley is to take two table-spoonfuls of pearl barley to four teacups of cold water; boil it until it is reduced one half, when it is strained, and to this is added a pinch of salt and sugar to flavor. To this boiled water is added sterilized or Pasteurized milk, in the proportion of one-third to two-thirds of the barley water for young babies, the proportion of milk being increased with the age of the child. Cream is highly recommended by some as the ideal food for young babies, only cream diluted by pure water to suit the age of the child and sweetened to taste being used. Egg albumen is another article of diet that has been found beneficial. The white of an egg is mixed with one half pint of water, to which is added a little salt. This is kept perfectly cool and given in teaspoonful doses every hour or two as may be necessary. If oatmeal is selected in place of the barley it should be prepared in about the same way, the water from both these cereals being thoroughly strained in order that there may be no husks to irritate the intestinal canal.

Sterilization.—Within recent years it has come to be the practice, and a wise one, to render cow's milk sterile when it is used as an article of food for children or for sick adults. During the milking process, as the milk is allowed to stand in open vessels, and as it is being prepared for use, it is very subject to contamination by the introduction of poisonous particles from the atmosphere or germs of disease from individuals handling it, from vessels in which it may be kept, and in various other ways. Milk is one of the very best media for the cultivation of noxious germs. It is presumed that while it is still in the udder of the cow it is aseptic; but, as has been shown, the fermentation of its curd is a bacterial process, at least ten different forms of bacteria having been seen microscopically to be engaged in the process of its digestion. It is readily understood, therefore, that cow's milk

may be a prolific cause of disease in young children whose digestive ferments are not yet strong enough to quickly digest its curd, and whose systems are not sufficiently resistant to preserve them from bacterial invasion.

Sterilization is accomplished by means of heat, and instrument makers have devised various ingenious apparatuses for the purpose of reducing the process to an art and making it easy of

accomplishment. Arnold's, one of the best, is shown in the cut. The sterilization process wholly consists in hermetically sealing the milk while scalding hot. If sterilizing is properly done milk will remain sweet several days, a fact of no small importance in tiding through the night and in travelling. In southern climates, especially, sterilization should generally be practiced where milk is used as a baby food. In the absence of a sterilizing apparatus milk may be rendered sterile by being carefully prepared in any perfectly clean vessel, the essentials of the process being the destruction of bacteria present in the milk by bringing it to the proper heat and then sealing it tightly. The ordinary glass-stoppered flask does not answer the purpose, neither does sealing with



FIG. NO. 2.

ordinary cork, unless sealing-wax or bees-wax be immediately applied. The proper bottle is supplied with a perforated cork and glass stopper. Sterilization can be performed in the humblest home without anything in the way of apparatus other than the ordinary kitchen utensils and such a bottle.

It is not desirable to continue a child on sterilized milk very long at a time. While doubtless rendered free from noxious influences, which have been admitted during and after milking, yet the process also destroys the native bacteria of the milk that

bring about the fermentation and solution of its curd, and because of this fact it is rendered somewhat difficult of digestion and not suited to continued use. If it is desired to continue it for a considerable period of time it is better to peptonize it by the addition of a proper proportion of peptonizing powder while sterilizing. Vaughan and other recent observers now treat of many diarrheal diseases of infants as acute milk infection due to toxigenic bacteria. They do not hold that there is a specific micro-organism, as in tuberculosis, but that only one of the large class of germs may be present and produce gastro-intestinal disturbances peculiar to the diarrheal diseases. Vaughan treats of bacteria as the most common and deadly cause of infantile diarrhea, and is so emphatic as to italicize his injunctions that a nursing infant suffering from diarrhea should not be given a drop of milk during its illness. The microscope and culture tube have certainly made many problems very plain, and with the information before us it is doubtful if we are justified in administering raw milk to very young children at any time, not in giving it under any circumstances unless it shall have been rendered innocuous; and certainly when intestinal disorders shall have set in milk should be religiously interdicted.

In order to render milk sterile it is not necessary that it shall have been boiled. The boiling of milk expels about three per cent of its gases and changes its odor and taste decidedly. Its albumen is coagulated by heat, and a certain amount of its fat is held in the scum that forms upon it. It is no longer contended that boiling renders milk very much more difficult to digest than simple scalding, yet it is not so palatable, and there is no doubt that its curd coagulates in larger masses than if the milk is simply "scalded," as the process of pasteurization is commonly called. It must be remembered, however, that the chief thought in relation to this process is not more to destroy the bacteria already in the milk than to prevent their further development, and by so closing it in sealed flasks to prevent the occurrence of invasion from without; so that it is not enough to simply scald the milk in an open vessel. Sterilization must be done with precision, and the immediate sealing of the vessels in which it is to be retained must be performed perfectly if the desired object is to be attained.

As has already been stated, sterilized milk is a very unsatisfactory diet when used for any considerable length of time. It does not seem to meet the requirements of a perfect food. Certain chemical changes are shown to take place in milk when heated from 167° to 212° F., and the higher the temperature the greater the change. The ferment that liquifies starch is destroyed and coagulated by excessive heat, and a part of the lact-albumen is coagulated. The casein is rendered less coagulable by rennet, and is more slowly and imperfectly digested by pepsin and pan-

creatin under the influence of extreme heat. Milk germs are also destroyed, so that in many cases the sterilization of milk so completely changes it as to render it unsuitable for use as food over considerable length of time. It is for these reasons that it is better not to boil milk. Pasteurization below the boiling point accomplishes about the same results as are accomplished by boiling, and the greater the degree of heat applied to the milk the less satisfactory it is as an infant food.

Pasteurization.—Pasteurization of milk accomplishes the destruction of such forms of micro-organic life as are likely to be harmful, and yet the milk is not heated to that degree under this method that results in its being rendered unfit for food. Its temperature is not carried higher than from 131° to 176° , the milk being cooled rapidly after having been heated. The bacillus is destroyed at 167° for ten minutes, at 158° for fifteen minutes, and at 155° for thirty minutes. A simple method of preparing food according to the plan followed by Pasteur is as follows: A pail is filled with water to the height of a groove marking its proper depth, with supports on the inside for the receptacle of bottles of milk. This receptacle consists of a series of hollow cylinders, made of zinc bound together and fitted in a pail so that the top of the cylinder is at almost a level with the top of the pail. The pail is filled with water to the level of the groove and put on the stove, the water being brought to a boil. The bottles to be used are filled with milk and stoppered with cotton and placed in the cylinder. Sufficient water is poured into each cylinder to cover the body of the bottle for the purpose of communicating the heat to the milk. When the water in the pail is brought to a boil it is set to one side on a table or other non-conductor substance and the receptacle containing the bottles of milk is placed within. The pail is then covered by its lid and is allowed to stand with the zinc cylinder in the hot water for half an hour, when the milk is removed and placed immediately in a refrigerator where it may be kept without spoiling for several days. Milk thus treated is rendered as safe as boiled or completely sterilized milk, and the infant will not tire of it as of milk subjected to a greater degree of heat.

Examination of raw milk in the bacterial laboratory shows as high as from 8,000 to 230,000 bacteria to each cubic centimeter, while after Pasteurization usually none are found. This treatment of milk destroys not only tubercular bacilli but the bacteria of typhoid fever, cholera and pneumonia and most of the milk germs, and does not injure the milk. It is claimed that milk held in tightly sealed bottles, boiled in a saturated solution of salt for half an hour, will keep perfect for a considerable length of time. This is probably due to the fact that it requires a higher temperature to boil salt water than fresh water; but the same objection obtains to subjecting milk to the degree necessary to its steriliza-

tion as is necessary in fresh water. Christopher, of Chicago, in an important article in the *Journal of the American Medical Association*, reaches the following conclusions:

1. In instituting artificial feeding, the alimentary canal of the infant should first be put into normal condition, and during this period the food should, irrespective of its properties or value as a complete nutriment, be adapted to the condition of the alimentary canal.

2. The alimentary canal being in normal condition, the food used should be within the physiological capabilities of the baby.

3. The food adopted should be pure and if the conditions will permit it should be sterilized.

4. The food intended for the complete nourishment of the infant should contain the necessary proportions of proteins, carbohydrates, fats and salts, and the composition of human milk should be the guide in determining these proportions.

5. The anti-scorbutic element should usually be present. In its absence the child should be carefully watched and this element supplied when found necessary.

6. Sterilized milk and foods made up of dried milk-solids are deficient in the anti-scorbutic element.

7. Water is an essential ingredient of the food-supply of the infant, and should be administered freely.

8. Foods which are deficient in one or more of the necessary ingredients lead to the development of various forms of imnutrition, particularly rickets and scurvy.

9. The infant should be fed at regular intervals and not overfed.

10. The best artificial food for a healthy infant is pure milk from healthy cows, properly diluted and sweetened and sterilized, if the conditions of nutrition permit.

Weaning.—Children should not be allowed to nurse the breast longer than twelve months ordinarily. In individual instances it will do to put them on a mixed diet much earlier than this, but rarely will it be safe to take them from the natural food before the first year. In occasional instances it may be wise to continue the nursing a month or two longer. If experience has already been had with artificial diet or mixed food that has not been satisfactory, and an infant is again thriving at the breast, it may be well to continue it on the maternal food until the thirteenth or fourteenth month. It has been the author's experience, however, that more children are sacrificed in the second summer by attempting to nourish them on maternal milk, which no longer contains all the elements necessary to their evenness of development, than are lost by too early weaning. After the full establishment of menstruation in the nursing mother children are especially liable to gastro-intestinal disturbances at every appear-

ance of the catamenia. To many the altered state of the milk at this time is absolutely poisonous, while upon others it seems to have no ill effect. But in a general way the re-appearance of menstruation should be accepted as nature's call for the discontinuance of lactation. It is not always necessary to obey that call, especially if it should occur early; but if the mother carry her infant at the breast for several months and then nature re-assert herself it will be wise to promptly place the child upon a carefully selected mixed diet, with reference to its early removal from the maternal breast.

Weaning may be accomplished immediately or gradually. It is usually more certainly and readily accomplished, and with least trouble, if the child is at once removed from the breast. In gradual weaning the intervals between nursings should be more prolonged day by day for the period of three or four weeks. If the child has been nursing as often as every three or four hours the interval should be lengthened an hour or two, and perhaps some other food supplied if it shows much hunger. If it is near a year old, rice and milk, bread and butter, or a bottle food composed of cream, milk, sugar of milk and water, prepared in accordance with Miège's formula, and given as outlined in the chapter on Infant Feeding, may be required. If immediate weaning is practiced there will generally be a struggle of a day or two with the baby, which is rather trying upon it and also upon the sentiments of the mother; but it is a struggle soon over, and unless the infant's health be impaired, or its nervous vitality be considerably exhausted by its rebellion, it is the better plan to stop the mother's milk at once and place the infant upon its mixed diet, or upon some of the preparations of cow's milk, as may be selected.

In acute illness of the mother sudden termination of maternal nursing is the better plan. Typhoid fever, erysipelas, diphtheria, acute rheumatism and other zymoses demand immediate weaning, no matter what the age of the child. If she be a tuberculous subject, she ought not be allowed to nurse her baby from birth; and it goes without saying that if acute pneumonia be followed by confirmed pulmonary disease the baby should be at once weaned, as, in fact, it should be upon the development of the primal disease. Babies will have to be weaned, also, if pregnancy occur early. This is one of the most certain causes, in my personal experience, although I am not upheld in this by some authors, of fatal illness in tender infants, and the continuance of a child at the breast during two or three months of pregnancy is almost certain to result in impairment of its health. Its blood is rendered anemic, and constitutional dyscrasie, to which it may be even remotely disposed, are likely to develop in its system if it is continued at the breast after its mother has become pregnant.

Weaning is sometimes made necessary by mastitis. One of the most painful conditions to which the mother is subjected is

the nursing of her infant from an inflamed breast or upon a cracked nipple. Furthermore, it cannot be wholesome for the baby to receive its milk supply from an inflamed or suppurating breast, or from a nipple that is sore, cracked and bleeding. And yet it is not always best to immediately wean a young baby upon this cause. Sore nipples and mastitic breasts may be cured with sufficient promptness to enable the infant to remain upon its maternal food, with but brief imposition of the unsuitation of disease in the mammary organ; whereas, its life may be endangered by placing it upon artificial food at any time during the first twelve months of its life. Therefore healthy conservatism should be practiced in this relation.

Weaning will be more easily accomplished by removing the child from the mother's presence altogether. It should be made to occupy another room, or be farmed out to its grandmother or other competent person to be taken care of for a day or two until it becomes accustomed to the changed condition. A little gentle firmness and reasonable care in the selection of food to take the place of the maternal milk makes weaning so easy of accomplishment that I have no sympathy with those mothers who, because of their lack of decision, continue the child at the breast for weeks or months after their food ceases to be sufficiently nourishing for its demands.

The practice of continuing the infant at the breast longer than the natural physiological period in the hope of thus avoiding another pregnancy is next to criminal, and cannot be too severely condemned. The changed physiological demands of the infant's system require elements that are not found in the mother's milk, yet this fluid is often sufficiently nourishing to satisfy the superficial demands of the baby, and it seems apparently to thrive until some illness attacks it, when it will be found, too late, that its system has not been rendered sufficiently resistant by virtue of proper feeding to withstand the course of an ordinary ailment, from which most children would recover. It is perhaps but just to suggest that most mothers are not aware of the danger to which they are subjecting their infants by this course; but carelessness on the part of the physician is deserving of condemnation, and failure to properly educate the mothers of children entrusted to his care renders him deserving of censure.

Conclusions.—As has been stated, the newly born infant will usually lose weight for the first week, or will no more than hold its own at any rate; but if its nourishment is such as to properly support it it should gain five or six ounces per week during the first few weeks of its life, the average weight at the end of the second month being about ten pounds, allowing eight pounds as the weight at the time of birth. From this time on it will grow a little more slowly, perhaps, and four or five ounces in gain per

week will be made, so that at the end of the fourth month Ashby and Wright quote the infant weight at thirteen pounds. If it is thriving nicely and is neither unusually well nourished nor poorly nourished, by the end of the sixth month the infant will have doubled its weight and will tip the scales at sixteen pounds. During the last six months of the first year the gain is not so rapid as in the earlier months and by the end of the first twelve months the average weight will be about twenty-two pounds. There is no more certain way to diagnose mal-nutrition or failure on the part of its food to properly nourish the young infant than a steady loss in weight. The natural course in infant life is growth, and rapid growth during the earlier months. Whenever this is not the case there is something wrong either with the child itself or with its food, and the physician will do well when his attention is called to the fact that the baby is not thriving to institute a series of careful weighings, rather than to trust alone to the physical evidences of possible mal-nutrition.

The problem of artificial feeding is one of the most difficult to solve in general medical practice. In the south and southwest, in which section I practiced for more than fifteen years, the long tedious summers with their debilitating influences upon the women of that section make it necessary to resort to artificial feeding in a considerable proportion of cases. These enervating summers have their effect also upon young children, and if diarrhoeal diseases set in early in the summer the interminable hot season makes the question of infant feeding one of deepest concern. While almost wholly exempt from the sudden, violent outbreaks of cholera infantum peculiar to more northern sections, yet the total number of cases of cholera presenting through the seven months of summer experienced in southern latitudes is quite sufficient to give the practitioner all the opportunity he may desire for careful observation and wide experimentation. The long-continued heat has its effect also upon prepared foods, and not infrequently difficulty arises from this source. Altogether the digestive disorders of young children have long been my *l'ete mure*, and in consequence I have tried to carefully study the question of infant feeding, with the result that no flimsy excuse for early weaning is ever allowed to weigh for one minute; nor do I permit of a mixed diet with very young children, especially if their disorders come on early in the season or during the hottest months of the summer. Even though the mother's milk may not be altogether satisfying, I am convinced that it is better to have the baby only partially nourished on its natural food, providing there is already no gastro-intestinal disorder, than to run the chances of disturbing the stomach and bowels in trying to more rapidly build it to its normal plumpness. And especially did I learn to fear cow's milk in that section of country. The effect of the heat upon cattle, the poor quality of

food they are apt to get during drouthy seasons, and, if allowed to run at large, the almost absolute certainty of their slaking their thirst with impure water from low creeks and drying pools, are quite sure to result in an impure quality of milk. Again, in the rural districts it is often impossible to get ice, and as the water of most sections of the southern states is not cold as in the north the farms are not possessed of the regulation spring-house to insure the proper preservation of milk and butter; hence it is much more difficult to keep milk pure and sweet. When, therefore, it has not been thought possible to bring up a child on its mother's milk it has been my custom to secure a wet nurse if at all possible, if but to tide over the first three months of infant life; and next in order I have learned to rely on baby foods, prepared under the theory of Liebig, and clinically proven to be correct, that it is the conversion of starch into grape sugar that is necessary to the preparation of a safe and useful baby food.

When once diarrhical disease is on it may be found necessary to suspend the regular nourishment, no matter what it may have been, for a day or two, relying almost wholly upon water, with, perhaps, a very small quantity of some other selected food, until the irritation shall have been allayed, when the necessary diet may be safely resumed. It is no more invariably necessary to make radical and permanent change of food when infantile illness is present than to do likewise with adults. The temporary suspension of what may be the cause of the illness will sometimes suffice to give the child a few days of rest, and it can then go on with its regular diet as before. I am quite sure serious mistakes are often made in frequently and radically changing the food of young babies.

CHAPTER III.

INFANT HYGIENE.

Oil Baths—Water Baths—The Toilet—Bosier—Air and Exercise—Care of the Eyes.

Oil baths.—It has been the custom from time immemorial to give the newly born infant a warm bath immediately upon its arrival into the world, but it is now understood that this is a common cause of broncho-pneumonia among children, and early death from congestion of the internal organs, excited by the removal of the protective oil of the skin and the taking of cold while the child is being bathed, and the wiser process of allowing the first bath to be an oil inunction has been established. Instead of giving

the child a water bath it should be thoroughly anointed with warm olive oil immediately upon being separated from the placenta. By the free application of oil, applied by the hand and followed by gentle wiping with soft flannel cloths, the infant can be more thoroughly and easily cleansed than by the water bath. The anointing should be thorough, especially in the arm pits, groins, and folds of the skin about the genitals, and over the scalp, and about the ears and neck. The eyes should be carefully wiped with lint, and the mouth and nostrils may be cleansed in like manner if necessary; but the practice of giving the newly born babe a water bath is discountenanced. In order to guard against the development of an irritating rash the oil should be sweet and pure olive oil, and the drying of the child should be gently but thoroughly done. For purposes of cleanliness local bathing about the genitals and perineum should be practiced after each urination and stool; but it is not necessary to give the baby a general water bath for two or three days after its birth. Oil baths may be repeated every morning if necessary up to this time, and even after bathing is commenced it is better to thoroughly anoint the infant after its bath.

Water baths.—After the second or third day the general warm bath may be given every other morning or every third or fourth morning. The routine practice of the daily bath of the new born infant is not justifiable by reason nor defensible from the standpoint of necessity. There is nothing uncleanly about the little fellow, and if reasonable care be taken to protect him from unnecessary soiling by urination and defecation it is not essential that he should be submitted during the first few weeks of his life to the handling and exposure and churning necessary to the proper performance of the bath. As the infant grows older and stronger he will enjoy his morning ablutions. It is usually one of the greatest pleasures of child life to splash and play in the water every morning; but even here intelligence should be exercised on the part of the parent or physician, and should the child object to the bath it need only be given for purposes of cleanliness. Many children are tortured day in and day out, week in and week out, by unnecessary bathing, against which they rebel with all their might. In special instances this aversion is constitutional and should be respected. When it is so pronounced that necessary bathing can only be accomplished under difficulty, because of the vigorous objections of the infant to the application of water to the skin, an occasional dose of *Sulphur*, in high attenuation, will usually overcome the antipathy, and bathing will become less of an objection, if not altogether a pleasure. Routinism is no more justifiable in infant bathing than in any other practice.

When bathing is practiced it should be done at a regular time and in the morning, usually about the middle of the forenoon.

At first the tub should contain but enough water to make the bath of the infant by hand or soft cloth easy, but as the child is able to sit up in the tub and enjoy his bath it should contain enough water to come well up to his waist or chest. The practice of bathing a child's head first, before immersing his body, is a good one. It is not necessary to use a great deal of soap, and, in fact, if the bathing is carefully done or the child's skin shows minimal tenderness or susceptibility to the action of chemicals it will not be wise to resort to it at all. Harsh soap is a frequent cause of chapped skin, roughness, tetter, and other skin diseases. The best soap for infant use is unscented castile, and it should be remembered that the delicacy of baby organism renders the use of highly scented soaps objectionable. The child's bath should be warm, about 95° F. Bathing in connection with certain diseases of childhood is a very helpful adjunct, and will be discussed in connection with individual ailments.

The Toilet.—The successful dressing of infants is an art. The simpler the dress the better. There is no more certain torture for a young child than to dress it to excess. The first article of clothing is the diaper. As a rule this is several times too large and cumbersome, and is one of the causes of genital eczema and also of bow-legs. It is not necessary to have four or five thicknesses of bird's-eye wedged between the infant's legs, covering its thighs and buttocks. The quantity of urine voided at each micturition is not more than an ounce. It is sufficient to have no more than a single thickness of diaper, with a fold of lint, old linen, thoroughly clean, or absorbent cotton, folded about the nates and genitals to receive the urine and excrement. This may be removed as often as needed, destroyed or thrown into the fire. Thus a great deal of unpleasant laundrying will be avoided. Just as the sanitary napkins are now being used during menstruation so may similar devices be resorted to in the care of the newly born infant.

The outer garments should be very simple. That to be worn next the skin should consist of exceedingly soft baby flannel, made in a single piece of sufficient length to extend to about a foot below the feet, with sleeves to the wrists; the hems and seams may be turned on the outside, so that nothing rough or irritating will be next the child's skin. The second garment may be made the same shape as the first and without sleeves. It is an inch or so larger than the first, so that it will fit outside of it, and the armholes and neckband may be scalloped so as to be comfortable to the child. If it be desirable to have the first garment of other material than flannel, because flannel renders the child uncomfortable, the second garment may be of flannel, that the infant may be kept warm and comfortable. The outer garment or dress is to be made of any material desired; it may be made as drossy as the mother may wish, but should be exceedingly plain.

When dressing time comes these three garments may be put together, body within body, sleeve within sleeve, this being the Gertrude dress of Prof. L. C. Grosvenor, of Chicago, and by all means the simplest and most sensible baby dress yet devised. By being thus put together the garments may be slipped over the head as if but one, and a great deal of unnecessary handling and turning of the infant is avoided. Draw-strings and buttons are put at the back of each garment, and thus toilet pins are unnecessary. The back is open downward five or six inches, and one button is located about the middle of each open space. The night gown is made of the same soft material as the under garment of the suit.

The Gertrude suit consists of the three garments, made just as simple and plain as can be, the outer one alone being dressy, the simple night gown just mentioned, and two diapers. The outer diaper consists of cotton flannel and is eighteen inches square, the inner and smaller is ten inches square. It is inserted within the outer one and receives the soiling, so the laundering of diapers is largely confined to the smaller cloths.

It is the practice with a great many people to use an oiled silk or sheet-rubber diaper outside the bird's-eye or cotton flannel for the purpose of protecting the outer clothing. This is a very unhealthy practice. The imperviousness of the protecting rubber prevents evaporation from about the buttocks and genitals, and also the evaporation of the watery elements of the urine and feces, with the result that these are confined to irritate and often excoriate the tender integument of the infant. There are objections, not only from this point of view, but also from the fact that the very cumbersome tends to cause additional bowing of the thighs.

Binder.—I have long since discarded the use of the belly-band as an article of infant dress, as also the infant shirt. The former tends to prevent normal distension of the abdomen arising from the formation of gases, and thus interferes with the proper circulation of blood in the abdominal walls and viscera, this being one of the prolific causes of infantile colic. Furthermore, prior to the separation of the cord it is apt to adhere to the band and be dragged upon, to the child's discomfort and the possible resulting of umbilical hernia. As belly-bands are not needed by other members of the animal kingdom no more are they necessary with human infants. The shirt is objectionable in that it is apt to gather in folds across the back and even up to the armpits, to say nothing of the inconvenience and annoyance of the unnecessary dressing belonging to the ordinary toilet of the infant. For the first few months no harsh points, puffs, frills or furbelows should characterize the infant toilet. Pointed tapes, crochet work, harsh embroidery, no matter how pretty, are an abomination in connection with the infant wardrobe. In southern climates only a garment or two in addition

to the diaper will usually answer all requirements. In northern climates the three garments in one of the Gertrude suit will be found to be all that are needed, and so much more comfortable to the infant than excessive dressing that nothing more should be allowed, excepting such outside wraps as are required.

As the child grows in months it may be dressed to suit the taste of its maternal queen, it being always borne in mind that the child's comfort and hers will be best secured by plainness and simplicity, and freedom from constricting bands and harsh though beautiful trimmings.

Air and Exercise.—For the first two or three months of infant life, in northern and temperate latitudes, air and exercise will be limited to indoors. If born in the winter in a northern climate it is usually not advisable to take the infant from one room to another or from one floor to another until two or three months old. If born in the summer season or in southern climate the fresh air of outdoors will not only not be harmful but be much enjoyed, even if the child be but a month or so old. If properly dressed, that is, lightly and simply, the infant will get all the exercise necessary from the handling incident to bathing and dressing, and such as it gets in its bed. No hard and fast rules can be laid down as to the amount of exercise and exposure to fresh air infants may be subjected to, very much depending upon the individual child, the social and domestic surroundings of its parents, the seasons and other considerations.

At about the eighth or tenth month, at most, infants will show some disposition to creep. I am not much in favor of this practice. It delays the more natural habit of walking, is hard on the hands, and, as most mothers will attest, is quite trying upon the clothing. However, if the disposition to creep is pronounced, it is better to allow the infant to enjoy the exercise and development that arise therefrom than to press him into too early efforts at pedestrianism. Once on his feet the child will get plenty of exercise. By the end of the first year most children will be taking steps, and by the fourteenth month will be walking quite at will. In very many instances children walk much earlier, at the end of twelve months, for instance. If effects in this direction are postponed much beyond the fifteenth month it is indicative of delayed ossification, and attention needs to be given to diet and treatment.

Care of the Eyes.—In recent years ophthalmologists have given a great deal of attention to the care of the eyes of the new born. It has been shown that a very large per cent of blindness is caused by ophthalmia neonatorum, and that gonorrheal ophthalmia is of very common occurrence among the children of people of impure lives and unsanitary habits. Ophthalmia also occurs from the irritating effects of the maternal and infant excretions upon the conjunctiva from lack of cleanliness at the time of birth, and it has

come to be quite the rule in foreign hospitals to treat all infants to the external application of a one to two per cent solution of nitrate of silver immediately after birth. In Ohio a law was recently passed making it incumbent upon midwives and accoucheurs to report all cases of ophthalmia neonatorum, in order that they may receive proper local treatment with a view to preventing blindness. It will be found sufficient to insure health to the eye, however, if the proper precautions are taken as the child is being born to clear the palpebral fissures of all secretions and subsequently to bathe the lids and eyes with sterilized water, without resorting to the topical use of nitrate of silver or other caustic solution. Chemicalization may be justified in the fouler neighborhoods of large cities, and in maternity institutions whose patrons are from the lower classes; but it is not necessary to resort to measures of this character in private practice, as a rule, and carelessly performed the application of even a weak solution of nitrate of silver may be productive of harm.

CHAPTER IV.

DENTITION.

Fetal Development—Temporary Teeth—Permanent Teeth—III Effects of Teething.

Fetal Development.—The study of embryology teaches that part of the process of teething is accomplished in the fetus. As early as in the seventh or eighth week of fetal life the development of the maxilla is begun. The teeth are forming also, and making ready to continue their growth and perform their eruption in regular order in infant life. At birth the jaws contain the dental sacs with the temporary teeth well under formation, even to calcification of their crowns. There is also present in the jaw

at this time the calcified crown of the first molar, located immediately back of the last temporary molar. The teeth continue to develop in the jaw, and finally there is a simple line or point for each beneath the



FIG. 3.

maxillary membrane, the tooth cutting its way through gradually as it is developed from below until the infant is supplied with its temporary set.

Temporary Teeth.—The temporary teeth are twenty in number, ten below and ten above, five for each jaw to the right and left, respectively, of the median line. In this temporary set there are four upper incisors, four lower incisors, four canines, four first molars and four second molars. In order of appearance they present in groups. The first group consists of the lower central incisors, two in number, which appear anywhere from the fifth to the eighth month; it is quite common, however, to witness their eruption when the baby is from twelve to sixteen weeks old. These teeth usually come very close together, being erupted about the same time. There will then be an interval of about three or four weeks, and the four upper incisors will show themselves in rather quick succession, from the seventh or eighth month up to the tenth or eleventh month of life. There will then be an interval of rest of from one to three months, when the third group will appear, consisting of two lower lateral incisors and the upper front molars, to be followed quickly by the lower front molars which go in this third group. By the time these show the child will have attained the age of fourteen months. A long period of rest now occurs, the fourth group, consisting of the four canine teeth, not



FIG. 4.

usually showing until the eighteenth or twentieth month. The fifth or last group consists of the four second molars, two below and two above. This set is not usually seen until after the child has attained the age of two years, while it is sometimes delayed until the twenty-eighth or thirtieth month, or even longer.

It has been my experience that southern-born children develop their teeth much more quickly than those born in the northern climates. Many children born in southern latitudes have their first teeth at three and a half months, and the eruption of other teeth is correspondingly prompt. My third child had all his teeth excepting the four second molars at eleven months of age, and I have witnessed like precociousness in this direction in a great many other southern-born children. On the other hand we occasionally meet with children in whom the eruption of the teeth is very tardy, it being not at all uncommon for a child to attain the age of ten or eleven months before the eruption of a single tooth. It is the testimony of dentists that children who are slow in erupting their teeth are slower in losing them, unless delayed dentition is because of the rachitic habit or other constitutional dyscrasia.

The temporary is known as the milk teeth. Occasionally a child is born with one or more teeth fully erupted. This

temporary set remains usually for a number of years, occasionally being so firm and strongly set in in the maxilla as to interfere with the proper coming of the permanent set. Except in instances in which decay sets in early the temporary teeth are usually all present at the end of the sixth year, when the permanent teeth begin to show themselves.

Permanent Teeth.—The permanent teeth erupt in about the following order: First molars, which, it will be observed, are present in embryonic form at the birth of the child and erupt at six years; the central incisors a year later; the lateral incisors at eight; the front bicuspids at nine; the posterior bicuspids at ten;



FIG. 5.

Fig. 5.—Lower jaw of Child of about three years, showing the relation of the temporary and permanent teeth. The milk teeth of the right side and incisors of the left are shown, and also the buds of the permanent set, except the wisdom-teeth, which is not yet formed. The large sac near the front of the jaw is that of the first permanent molar, and above and behind it is the rudiment of the second molar. (Quain.)

the canines cut through at from eleven to twelve; the second molars at from twelve to thirteen, and the other molars anywhere from seventeen to twenty-four or twenty-five. More teeth occupy the jaws at the age of six or six and a half years than at any other time, there being present a full temporary set of twenty, all in full eruption, and the whole permanent set ready for eruption, excepting the wisdom teeth. Attention has been called to the fact that at this age the lower features of the child undergo material change, owing to the development of the maxillary points forward in order to accommodate the increase in the number of teeth from twenty, the temporary set, to thirty-two, the permanent number. The permanent teeth are also larger in size and this elongation of the jaw is quite noticeable in most children to the careful observer.

There are all sorts of deviations from the normal teething course and process. Many children lose their temporary teeth quite early. In others they are irregularly erupted, not following the usual order. When irregularities occur they are apt to be

attended by disturbances of health, such as gastro-intestinal diseases, rickets, syphilis, tuberculosis, hydrocephaloid states and various disorders of the nervous system, as exalted sensibility, nervous debility and convulsions, and even lesions which show by the development of choreic and paretic-like movements, due to exhaustion of the nervous vitality from the pain and irritation belonging to abnormal teething, and also to relative disturbance of the physiological proximate principles, especially as they relate to the nervous and osseous systems.

Dentition is purely a natural process and should not be attended by ill health of any kind; but while this is physiologically axiomatic it is rare that children escape local and constitutional disturbances of varying intensity while cutting their teeth. There is nearly always present heat of the gums, pain and irritation, considerable salivation, and, not infrequently, gastro-intestinal disorders. In children who are perfectly well these manifestations are apt to be slight, perhaps so very slight as not to attract attention; but in other children they are exceedingly pronounced and the pain and nervous perturbation that arise during the eruptive period make the child very miserable and unhappy and its care a burden. Much will depend on the temperament of the infant. If it be of high strung and delicate nervous organism the teething process is no simple matter; on the other hand, if it be of sturdy, robust, lymphatic constitution but little if any inconvenience may be experienced.

III Effects.—The remote symptoms or constitutional disorders belonging to teething are apt to affect either the gastro-intestinal or



FIG. 6.

the nervous system. If the alimentary tract suffers there is likely to be diarrhea, much more so than vomiting. It is not uncommon to observe an infant who suffers from diarrhea with the cutting of each tooth. There is always greater likelihood of disturbances in those of diarrhetic tendency with the development of the stomach and eye teeth, the intestinal disorders being then much

more pronounced. When the nervous system suffers the shock is sometimes mild, severe sometimes, sometimes fatal, especially during delayed dentition or during the difficult eruption of the

canine teeth. The infant may be in good health, apparently doing very nicely, when all at once, with only the premonition of a little irritation and nervousness, it may arouse from sleep or go right off from its play or from one of its fretting spells into a severe spasm. Especially do convulsions occur in connection with the cutting of the eye teeth. And while the teething process is a physiological one ordinarily it becomes physio-pathological in a large number of cases. It has been my rule for some years past to so consider it, and to intercept difficult and delayed dentition by proper diet and medication, and to institute such lines of prophylactic treatment as dentition sets in as to nearly always secure to the child immunity from the severer disturbances belonging to the cutting of the teeth. These will be discussed in the proper chapters.

CHAPTER V.

DISEASES OF THE NEW-BORN.

Diseases and Injuries—Asphyxia—Secondary Asphyxia—Apoplexy—Ophthalmia Neonatorum—Blood Tumors of the Scalp—Obstetric Paralysis—Interna—Umbilical Hemorrhage—Umbilical Infection—Tetanus—Other Diseases of the New-Born.

Diseases and Injuries.—The infant is subject to injuries at the time of birth and to various diseases incident thereto which sometimes tax the skill of the physician. Among the commonest of these diseases are asphyxia, apoplexy, hematoma, paralysis, jaundice, and hemorrhage from various organs and membranes. The most common cause of death at the time of birth or immediately following is asphyxia, brought about through interference with the oxygenation of the fetal blood.

Asphyxia.—Death from this cause occurs more often before the birth of the child than after, and is therefore not always amenable to the efforts of the attendant. When it occurs before birth it is generally the result of death or syncope of the mother. It may also occur from early separation of the placenta, or compression of the cord, and perhaps from undue compression of the brain superinduced by the impaction for a considerable period of time of the fetal head in the bony outlet of the pelvis, and occasionally from faulty or long-continued compression of the head by the forceps. It may also happen from the wrapping of the cord two or three times around the child's neck, and consequent compression of umbilical circulation as the cord is dragged upon during hard and prolonged labor pains.

The attendant should always try to diagnose the time of the occurrence of asphyxiation in each individual case in order that there

may be no blame resting upon the accoucher. If alive when born but still so severely asphyxiated that resuscitation is impossible, the pulse will be very rapid and exceedingly feeble and the general appearance of the body pallid, with the face exceedingly so, or very livid and swollen. If asphyxia is recent lividity is more likely to

characterize the child's appearance than pallor. If of longer duration the local congestion will have subsided and in appearance the infant will be more pallid. Children born with this degree of asphyxia rarely survive.


 TREATMENT. — Effects at saving the asphyxiated newborn should consist, first, of allowing the child to remain attached to the placenta by the cord just as long as it is pulsating, no matter how feebly; if there is no pulsation it is not likely the child will be saved, and the cord should be severed immediately in order that prompt

FIG. 7.

and vigorous efforts may be made at resuscitation. If it is to lie quiet and still connected with the placenta it should be wrapped in hot flannel and so placed beside the mother as to be perfectly dry and warm. A minute or two of time will determine whether resuscitation by this means is to avail. Immediately that this question is settled in the negative the child may be separated from the mother and promptly placed in a warm bath, as warm as can be well borne, care being taken not to injure the infant by excessive heat. It may be quickly dipped in hot water a number of times and then dipped quickly and alternately in hot and cold water.

Breathing is sometimes excited in children apparently dead by striking them sharply and quickly with the finger tips on the soles of the feet. Rectal dilatation with the point of the little finger, and the insertion of a small piece of ice in the rectum, serves to excite reflex action and induce breathing. Artificial breathing may be practiced by gentle compression at the upper part of the abdomen and lower part of the chest, the motion being directed inward and upward in a series of compressions and relaxations at the rate of about forty per minute. Quick, sharp, gentle clapping on the buttocks, and repeated turning and handling of the infant, sometimes head downward, will also serve to resuscitate it. Mild electrical currents have

been recommended in this connection, but it is not often that the battery is at hand and I have not been impressed with the thought that this method would be likely to be attended

by very great success and have never employed it. The faradic current is used over the diaphragm on lower part of the thorax. Asphyxiation of the new-born is sometimes overcome by efforts at artificial respiration that are altogether unsystematic, but it is more rational to follow some set plan, and to apply movements of the fetal body with intelligence and direction. Perhaps the best plan which has come under observation is that of Dew, of New York, highly commended by Lusk, Grandin and others, and which is as follows: Grasping the infant with the left hand, its neck is



FIG. 8.

allowed to rise between the thumb and forefinger, the head falling far over backward, thus straightening the mouth with the larynx

and trachea, thereby serving to raise and hold the epiglottis open. The upper portion of the neck and the scapula rest in the palm of the hand, and the other three fingers are inserted in the infant's left axilla, raising it upward and outward. (See Fig. 7.) If the baby is heavy the knees are grasped in such a way that they are held with the right knee resting between the thumb and forefinger, the left between the forefinger and the other three. If the infant be small and light it will be easier and more convenient to hold it in the same way by the ankles



FIG. 9.

instead of the knees, the calves to rest in the palm of the hand, instead of the thighs, as when the knees are supported, instead of

the ankles. The next step is to depress the pelvis and lower extremities so as to allow the abdominal organs to drag the diaphragm downward, and with the left hand gently bend the dorsal region of the spine backward, thus enlarging the thorax and gradually inducing inspiration. (See Fig. 8.) Then, to excite respiration, reverse the movement, bringing the head, chest and shoulders forward, closing the ribs upon each other and at the same moment bringing forward the thighs, resting them upon the abdomen. This movement arches the lumbar region backward and so bends the child upon itself as to crowd the contents of the thoracic and abdominal cavities, resulting in



FIG. 10.

a most complete and forcible respiration. (Fig. 9.) While this movement is rather a powerful one for the infant it can be done as gently as necessary and shock need not result. To expel mucus from the mouth and throat, Fig. 10 should be followed, the buttocks being elevated and the head and shoulders depressed. The various movements outlined in the foregoing description and in the cuts have been practiced in recent years with gratifying success. The use of alcohol, or whisky, applied in the armpits and groins, is a favorite domestic remedy, and seems sometimes to stimulate when ordinary methods fail. Gentle flogging over the dorsum

of the thorax, and various churning movements of the trunk and abdomen are practiced with varying degrees of success.

Secondary Asphyxia.—Asphyxia occurs also from causes operating after birth of the child, as unusual constitutional weakness or perhaps prematurity of birth. It seems not to have the power of life and asphyxiates of its own debility. Effusion into the chest cavity, pressure of enlarged glands upon the windpipe, and imperfect development of the internal organs may so interfere with the proper performance of breathing that the infant cannot sustain life. There is generally collapse of the air cells, atelectasis, and in this case the right heart and veins are distended, and sometimes pneumonic hemorrhage or cerebral effusion is present.

TREATMENT.—The treatment of this form of asphyxia differs, of course, from that of asphyxia neonatorum proper. The latter requires vigorous measures, but when asphyxia occurs a day or two or even a few hours after birth just the opposite measures will have to

be practiced. The infant should be kept very quiet and warm, being wrapped in hot flannels or cotton-wool and kept as near the stove as is consistent with safety. Or it can often be sustained for weeks at a time in an infantile incubator. It may be fed by a number twelve or fourteen flexible catheter being passed into the stomach, through which is introduced as much as half an ounce of hot water, or hot water flavored with milk, provided it is too weak to nurse or to swallow food administered with a spoon. Should feeding be attempted in this way to tide over the crisis the catheter should be quickly withdrawn in order to prevent reflux of the nourishment administered.

Incubation.—Children suffering partial asphyxiation are especially liable to suffer from severe catarrhal conditions of the lungs and bronchial tubes, especially catarrhal pneumonia, and it is often necessary to exercise great care, extending over considerable time, if these conditions are to be avoided, by inducing expansion of the air cells and maintaining the proper circulation of blood by artificial means until

such time as the infant shall have gained strength enough to sustain himself by natural processes. Winckel, of Munich, claims to have had good results from frequent bathing continued over a good length of time, with the temperature of the water from $96\frac{1}{2}$ to 100° F., the bath being



FIG. 11.

repeated as often as the necessities of the case seem to demand. This process suggests Winckel's special bath tub, not always to be had in private practice; but by the exercise of a little ingenuity on the part of the nurse the ordinary infant bath tub can be made to answer the purpose. The child should be immersed to the neck and the water kept at close to 100° , in order to secure active capillary circulation and proper pulmonary expansion.

Various incubators have been devised and are often very successful in hospital practice. That of Anvard is perhaps as good as any. (See Figs. 11 and 12.) It consists of a metal box, the interior of which is divided into two parts by an incomplete partition placed about two inches above the bottom, below which heat is

admitted as required. At one end of the box is a door that closes loosely in order to admit a small quantity of air. The upper part is arranged to receive the infant, and is covered in by a glass top fitted with knobs so that it can be raised easily. On the top of the box is also arranged a small tube containing a rotary fan which can be moved by a weak current of air. The atmosphere in the incubator is humidified by placing a wet sponge within the compartment. Very delicate children may be sustained in the



FIG. 12.

the little fellow on the bottom of an inverted baking pan in an oven, the door of which is only partly closed, a cup or can of water being placed within to properly humidify the atmosphere. It goes without saying that the utmost of care is necessary where temporizing measures are resorted to lest harm come to the infant through measures intended for its good.

Cases are reported in which incubation has proved successful with very small children. Hurst is reported by Carrier to have sustained an infant weighing but two pounds and fifteen ounces in an incubator until at five weeks of age it weighed four pounds and ten ounces, and was in other respects normal and healthy. Many instances are on record where children weighing from three to five pounds have been housed in incubators until they have attained six or seven pounds in weight, and were in every sense carried beyond the point of death from infantile debility.

Apoplexy.—*Apoplexia neonatorum* is the result of venous congestion rather than the result of injury to an artery, and takes place generally from the capillary vessels of the meninges or choroid. The pia mater is exceedingly delicate in early infancy, and its capillaries are so fragile that venous effusion therefrom is very easily produced. The cerebral sinuses and veins become distended with blood in asphyxia, and if rupture of a capillary vessel of the pia mater occurs, effusion into the sub-arachnoid space and brain may extend over quite a large surface, the blood clots com-

incubator and attain to a very satisfactory degree of strength when under ordinary means they would fail to survive. In country practice I have temporized for days at a time with the ordinary cook stove, placing

pressing the brain substance and causing death. Should the infant live it may have violent convulsions, and softening of the brain tissues at the site of the clot may finally occur. Hemorrhage in the brain will sometimes be induced by compression of the cord between the hard and bony parts of the pelvis, and consequent general engorgement of blood from the blood vessels and sinuses will occur in the brain. Rupture of the capillaries of the pia mater at the time of birth is almost invariably attended by convulsions. There is also spastic paralysis of both sides of the face. These cases are not uncommon and are usually attendant upon difficult labor. Cyanosis and convulsions may follow, and should the little subject live, as it may for several months or a year or two, it is likely to be the subject of convulsions for some months and more or less of idiocy. A case of this character came under my observation recently in which there were slight manifestations of intelligence and utter inability to move the head, arms or legs, even though the child was at this time a year old and as well nourished and plump as most children of its age.

Ophthalmia Neonatorum.—Infantile eye disease is among the common ailments of humble homes and unsanitary families. Especially is it a frequent result of maternal local infection. Present-day writers class it as one of the commonest causes of blindness, and stringent measures are being taken on the continent of Europe and this country to guard against it in maternity hospitals and foundling asylums. It presents as a specific or simple blennorrhœa, manifesting itself by swelling, redness, inflammation and discharge of purulent matter from the conjunctiva, usually coming on within a day or two after birth, sometimes not appearing until several days after. The lids swell so that it is quite impossible in ordinary examinations of the eye to see the globe, and the palpebral fissures are so occupied by pus as to hide the globe from vision. Upon forcing the lids apart there will be a free out-pouring of pus and the conjunctiva will be seen to be swollen and bathed in muco-purulent secretion. Chemosis and conjunctival ulceration characterize the condition. So great is this chemosis that in many instances the circulation is strangled by it and the nutrition of the cornea is cut off. Ulcers form, and if the circulation be completely destroyed the cornea is perforated, as it is sometimes by the severity of the ulceration, anterior staphyloma resulting, with complete blindness and destruction of the contour of the globe, and even the globe itself. Besides staphyloma, which may be partial or complete, adhesions occur, destroying the mobility of the iris and lens, and adherent leucoma or pyramidal cataract forms. In other cases extensive opacity of the cornea is left and thus sight is interfered with or altogether destroyed. Pan-ophthalmitis, the most destructive of the inflammatory diseases of the eye, is often the result of infant

eye infection, the eye ball shriveling and cicatrizing from this cause.

Ophthalmia neonatorum is commonly the result of gonorrhoeal infection. Yet it may occur from other causes, as from filth and virulence of maternal discharges without specificity. It is often seen in tuberculous children who are ill-nourished at birth, whose sanitary surroundings are of the worst and whose food is neither wholesome nor suited to infant life. The presence of the gonococcus, or the proven infectivity of the secretion, will alone determine the gonorrhoeal character of the case in the absence of known specific origin.

This form of ophthalmia should never be seen. It is preventable by strict practice of asepsis with the parturient mother and upon the eyes of the new-born. If asepsis is observed during labor but little attention need be given to the eyes of the infant. Even when gonorrhoea is known to exist in the mother the use of bi-chloride, one part to two thousand, for the purpose of washing and thoroughly cleansing the vulva and vagina, will render the parts sufficiently aseptic during the passage of the child's head as to exempt it from gonorrhoeal infection. But it is best to immediately bathe the everted lids, directly upon the palpebral conjunctiva, with a solution of nitrate of silver, of two or three, not more, grains to the ounce of distilled water, following this with a weak solution of salt water for the purpose of neutralizing the excess of silver.

TREATMENT.—The accurate treatment of ophthalmia neonatorum embraces certain procedures that are described by ophthalmologists as follows: Pledgets of lint soaked in ice water should be freely and continuously applied to the inflamed lids during the inflammatory stage, these being changed regularly every fifteen or twenty minutes during the inflammatory period, the object being to keep down the inflammation as much as possible. The practice in the New York eye hospitals is to lay small pieces of lint, of two or three thicknesses, as large as a silver half dollar, upon a block of ice, applying them directly from this, and changing every quarter of an hour, or oftener if earlier heated by the inflammation. The lids should be gently separated as often as necessary to accomplish thorough cleanliness by applying pieces of soft lint and gently wiping away all secretions, care being taken not to roughly handle the tender and inflamed cornea. Mild germicidal washes, as boric acid, calendula, or a one to two-thousand solution of mercuric bi-chloride may be used for this purpose, also. Then, when the discharge has become free of clear pus, generally thick and creamy, nitrate of silver should be applied upon the under surfaces of the lids, which have been everted for the purpose. All pieces of flaky pus, or secretion, should be removed, and the everted lids be brought close together by firm pressure, so that a

complete picture of the under surfaces is exposed to clear view. After these have been cleansed by gentle wiping, the silver solution, ten to fifteen grains to the ounce, may be applied by camel hair pencil or soft linen, the salt solution being followed immediately, thorough cleansing of the lids being essential to success. All pus should be carefully and thoroughly removed from the corneal surface and canthi, and the lids then be returned to their proper position, the edges being oiled with vaseline or other uncton.

The application of silver should be practiced with care. The general practitioner is not warranted in undertaking the treatment of ophthalmia neonatorum if there is a competent eye specialist in his parish. But it is his duty to attend to these cases promptly if without the assistance of an oculist. Thorough cleansing in the manner described, and the careful application of the nitrate of silver solution, perhaps never stronger than ten grains to the ounce of water, except when used by a specialist, will within a few days set up recovery from gonorrheal or non-specific ophthalmia. In case of difficulty in removing the pus the local application of a twenty-five per cent of fifteen volume peroxide of hydrogen will answer a good purpose. Alum water, bi-chloride of mercury, permanganate of potash and other germicides and eye washes have their place in connection with the purulent conjunctivitis of the new-born, but the consensus of opinion is toward the nitrate of silver as the most certain and effective of them all. And if applied upon the mucous surfaces of the lids in the manner described, and immediately washed away with salt water, the lids being at once dried by the application of soft lint or absorbent cotton, it is not only effective but harm to the delicate tissues of the eyeball need not result. In hospital practice it is used in all suspicious cases, and on the continent it is even the habit to thus treat the eyes of all hospital born children. But in private practice, and even in hospital practice, no treatment need be directed toward the infant's eyes if ordinary methods of asepsis are practiced, except the cleanliness that belongs to decency. The careful cleansing of the eyes at birth should be a part of the hygiene of the child. This may be accomplished without the use of any chemical if the nurse will but do her duty. The lids should be gently opened and all secretions should be mopped, not wiped away, by gentle pressure with absorbent cotton or soft lint, pure warm water being used to cleanse them of all mucus and maternal discharges that may have become lodged in the palpebral fissures. Cleanliness, absolute cleanliness, is the true prophylactic against ophthalmia neonatorum.

MEDICATION.—Little can be done in true gonorrheal ophthalmia neonatorum toward the preservation of the eye unless the secretion be rendered non-infectious by proper local treatment. But when

the proper methods are practiced to secure this condition, homœopathic medication will do much toward bringing about a prompt cure of the condition and toward preserving the integrity of the ocular tissues.

During the inflammatory stage *Aconite* is useful in relieving the pain, inflammation and swelling. *Belladonna* will be helpful if the conjunctiva is injected from the start, and if the lids look blue and congested. *Apis* may be needed if the chemosis is great and the edema palpebrarum is extreme. *Mercurius* is helpful when the discharge is thin and excoriating, and when it has been caused by specific or gonorrheal leucorrhœa. The child suffers more at night, and the lids are swollen and the lachrymation and photophobia are extreme.

Argentum nitricum is as helpful when administered internally, as when applied locally, in suited cases, and when used both internally and externally is perhaps the best of all remedies for this condition. The lids are swollen, the discharge plentiful and thick and yellow, and the chemosis is extensive. The infiltration of the conjunctiva is so severe as to endanger the circulation of blood in the cornea.

Hepar will be needed when the lids bleed whenever touched, and are so tender and painful that they can be opened with difficulty on account of the pain. Ulceration threatens or has already taken place; the discharge is thick and yellow. When hypopion has occurred *Hepar* is especially to be thought of, as also in a general unhealthy condition of the lids and conjunctivæ.

Besides the remedies named *Sulphur*, *Graphites*, *Nitric acid*, *Calcareo*, *Palatilla* and *Rhus tox* may be needed in special cases or conditions. Given the proper homœopathic remedy in connection with perfect cleanliness and local astringents will not often be needed. But it is doubted if we should rely upon constitutional measures alone when gonorrheal ophthalmia has presented in the eye of the new-born. It is so severely and rapidly destructive that the specific poison should be neutralized and destroyed at the earliest moment. And since this can be done in the manner described, without material if any danger to the eye, it is safer and better to resort to the use of both internal and external treatment.

Blood Tumors of the Scalp are far more likely to result upon injury at the time of labor than is apoplexia neonatorum. A collection of blood forms between the periosteum and skull, or perhaps beneath the occipito-frontalis and periosteum. This condition is known as cephalhematoma, and is divided into the internal and external varieties, depending upon whether the tumor is within or without the skull. Of the external there is that occurring beneath the muscle and that occurring beneath the periosteum. Of the internal there is the sub-cranial, or that that occurs just beneath the skin, and the sub-tenacoid, or meningeal hæmorrhage.

Blood tumor occurring without the skull is a more or less elastic mass, is circumscribed to the bone over which it is located, and does not extend beyond the periosteum to the bony sutures. There are no differences in appearance as to color. In shape and size they vary from that of a marble to that of a Tanger orange or larger. Within a few days the tumor begins to diminish in size, from absorption of the watery element and consequent shrinkage. The periosteum soon throws out a protective bony formation, as though it would endeavor to cover in the mass, and when the tumor will finally have shrunk away there may be more or less of a bony ridge marking its former circumference.

DIAGNOSIS.—Cephalhematoma will have to be diagnosed from the caput succedaneum and from meningocele. The former disappears in a day or two after birth, or earlier, and is not limited in area to the bone over which the tumor shows. Meningocele always corresponds to a suture or fontanelle, and increases in size with muscular efforts on the part of the child. It pulsates, also, and there will usually be brain symptoms accompanying the tumor.

The treatment of these blood swellings will be limited to the application of the indicated internal remedy directed toward the promotion of absorption of their fluid contents. Aspiration is dangerous from the fact that bleedings may continue to occur as the fluid is drained off, and there is also a possibility of infection. Whereas, if let alone, these tumors take care of themselves, even though their complete disappearance may be long delayed.

Obstetric Paralysis.—Injuries may happen to the infant at the time of birth that result in paralysis. These are due to the faulty or long continued application of obstetric forceps, or if of the arm or shoulder they may arise from efforts to disengage this part by the insertion of the attendant's finger in the pit, and long continued and positive traction applied thereon. The brachial plexus may also be injured by the forceps, although as a rule paralysis from this cause is limited to the face. Moderate pressure of the forceps, resulting in the elongation of the vertical diameter of the skull, is not likely to produce injury; but should the forceps be applied in wrong axis and an unusual degree of compression be practiced it may cause temporary and occasionally permanent paralysis. The latter is much more apt to follow injury to the brachial plexus, whether from the application of forceps or from pressure of the fingers.

Obstetric paralyzes usually clear up very satisfactorily, and while I have witnessed the facial form in numerous instances I have never known it to last longer than a few days. It is generally due to compression upon the peripheral nerves and not to compression of the brain.

Arnica.—*Arnica* is especially homœopathic to paralysis from compression of the brain or spinal cord; paralytic conditions

depending upon extravasation of blood in the brain from compression. The traumatic conditions through which the parturient patient passes promptly yield to a few doses of *Arnica*, and upon the same principle this remedy should be given to infants who have been handled roughly by the forceps or otherwise subjected to injuries or compression during birth. It is useful for the effects of injury to the nervous system, or any part thereof, from compression or extravasation.

Hypericum.—Bad effects of nervous shocks; spasms or convulsions from injuries to the head by compression or concussion. Mechanical injuries to brain or spinal cord. Laceration of nerve tissue and paralysis therefrom. When *Arnica* fails to prevent or promptly relieve facial paralysis resulting upon forceps delivery *Hypericum* may be given; also in Duchene's paralysis, where the brachial plexus has been injured from pressure of the forceps or of the finger in the axilla, or in injuries to the nerves of the arm or shoulder by wrenching efforts in delivery during powerless labor.

Rhus tox.—*Rhus* is useful where nerves have been injured by a strain, as of the brachial plexus from traction in the armpit, or after luxations, especially when *Arnica* fails to relieve.

Ruta.—Injuries to the cranium or cervical vertebrae, branches of nerves involved in the injury, with paralysis following. Luxation of shoulder-joint results in injury to the brachial plexus.

Badiaga.—Lesions and sugillations after compression or concussion. Cervical glands enlarged and indurated, with general history of rheumatism and of syphilis, paralysis occurring more easily in those suffering these dyscrasie.

Zincum, *Ignatia*, *Fluham* and *Cicula* may be thought of, but it will not often be necessary to go beyond *Arnica*, *Hypericum*, *Rhus* and *Ruta graveolens*.

Icterus.—One of the commonest disorders of the newly born infant is icterus. It usually comes on two or three days after birth and manifests itself by a discoloration of the skin and sclerotics. This discoloration, which is yellowish, is noticed first on the face, around the arms and chest, and finally on the abdomen and limbs. It may be so mild as to be overlooked or so pronounced that the child will be very yellow. The urine is always correspondingly high-colored and may show bile pigment. The bowels perform their functions regularly and contain the usual amount of bile.

The cause of icterus neonatorum is uncertain, but is believed to be due to continued patency of the ductus venosus, allowing the portal blood to continue to pass into the general circulation, instead of having to yield to the scavenger work of the liver. It is usually a simple ailment, not showing constitutional disturbances of importance, the discoloration clearing up in a very few days. It is not always trivial, however, and fatal cases may occur,

generally from carbonic acid intoxication of the blood and consequent coma. Severely jaundiced cases that do not promise well are generally dull and sleepy, slightly feverish, gradually becoming weaker and thinner and more yellow, and sinking off into a fatal sleep about the eighth or ninth day, in the natural course of the disorder.

Icterus is also due in occasional cases to prolonged labor, in which there has been unusually severe compression of the abdomen after the birth of a head. It may also arise within a few days after birth from "biliary pneumonia," occurring at the base of the right lung. In order to avoid the pain caused by respiration the liver is not sufficiently compressed, and stasis in its circulation and penetration of the bile into the blood occur as the result. When the compression has been severe, either during labor or from this localized pneumonia, the discoloration of the body may be pronounced and purpuric spots occur here and there, especially about the head and face.

TREATMENT.—There is not much to prescribe upon excepting the discoloration and drowsiness. If the bowels are torpid and sluggish and the child irritable and crying *Alex. lewisii* may be given. If the yellowness is very pronounced and what little stool passes is quite lumpy and curdy *Colloidalum* is to be thought of. If with the jaundice the hands and feet are cold and all the secretions and urine are highly colored, *Mercurius* may be prescribed. If the urine is saturated with bile and the yellowness is exceedingly pronounced and bright *Chionanthus* may be given with good results.

Umbilical Hemorrhage.—One of the strongest arguments against allowing the umbilical cord to remain unligated lies in the fact that occasionally children bleed to death from this cause. I have known of two such cases personally, although not occurring in my practice. More than once, however, I have had considerable hemorrhage from failure to sufficiently strangulate the blood-vessels of the cord, and in several cases I have re-tied it after other physicians. If it is to be the practice not to tie the blood-vessels should be drawn out of the cord by artery forceps far enough to admit of proper tortionizing. Death occurs from direct hemorrhage, or from asphyxiation from loss of blood to that degree that results in the collapse of a sufficient number of air-cells to make the case one of atelectasis. The remedy for umbilical hemorrhage is re-ligation.

I have never met with an instance of hemorrhage from the cord or navel resultant upon conditions of disease. It is recorded that syphilis, the drink habit, fatty degeneration of the new-born, maternal anemia, and perhaps other causes, sometimes operate to set up secondary hemorrhage. Should this happen from the cord it will have to be treated by re-ligation or pressure as before sug-

gested. If from the navel, astringent applications may be applied, and internal medicines to correspond with the constitutional state of the infant will be required. In rare instances of persistent bleeding of the navel the actual cautery may have to be resorted to.

Umbilical Infection occasionally occurs. Recently the author had a case under observation where there was an offensive discharge from the navel due to the retention of debris by the folding of the skin at the umbilicus, with constitutional symptoms dependent upon umbilical phlebitis. The proper cleansing of the navel with a weak solution of peroxide of hydrogen and the internal administration of *Arsenicum* promptly cleared the case. Severe symptoms may arise from this cause, as fever, peritonitis, jaundice and general septicemia. If the case develop with positiveness into one of pronounced umbilical phlebitis complications may arise which are usually unfavorable. The proper treatment of this condition is that belonging to general septicemia. The arteries of the umbilicus are subject to inflammation from the same cause, by the passage of the pus while the mouths of the vessels are still open, infection taking place as a rule through the cellular tissues surrounding the vessel. Metastatic inflammations arising from this cause are pneumonia, peritonitis, nephritis, inflammation of the liver and other organs. It also causes tetanus.

Omphalitis.—Infection at the site of the navel may set up circumscribed inflammation that is troublesome and sometimes extensive. It goes under the name of *Omphalitis*. The navel wound doesn't heal, the skin around it is red and shiny, and in severe cases there is a great deal of pain. There will be a discharge of a drop or two of offensive pus, and even when there is no pus present there will be an offensive odor from umbilical smegma, this sometimes lasting through life. Acute omphalitis may result seriously by general systemic infection, resulting in disease of one or more of the nobler organs; hence the necessity for care and thorough cleanliness. It is not at all uncommon for a child to suffer from sore navel for weeks or months, because of indifference and inattention on the part of the nurse when the cord dries off.

The treatment of omphalitis is that of septic inflammation anywhere. Perfect cleanliness and dryness of the wound should be secured. If necessary a weak solution of peroxide of hydrogen should be used to cleanse the bottom of the wound. If this is properly done internal medication will be unnecessary, otherwise *Amite*, *Belladonna*, *Apis* or *Arsenicum* may be called for.

Tumors of the umbilical cord are sometimes seen, usually dependent upon torsion of the cord. They may occur from degeneration of the vessels near the navel ring, and rare cases of myxosarcoma telangiectodes of the size of a small apple have been recorded. Hemorrhage from the navel occurs from congenital syphilis, sometimes as late as the tenth or twelfth day after birth.

Hemorrhage from this site in the new-born is invariably due to syphilis, or to the hemorrhagic diathesis, this in turn being oftener due to syphilis than to any other dyscrasia. Occasionally hemorrhage may be due to too early and vigorous separation of the cord by the nurse, and unless the cause be ascertained, confusion may occur in attempting to trace it to syphilis.

Tetanus.—Tetanus nascentium is not an infrequent cause of death in the new-born. It occurs usually within a few days after birth, and is supposed to be induced by the introduction of the bacillus tetani at the unhealed navel. It certainly is much more common among people whose hygienic and sanitary surroundings are not of the best. It has been thought to be due in special cases to faulty ligation of the cord or to injury at the navel, but it is now well understood that it is purely the result of infection, and it is easy to understand how the umbilicus may be the site of the introduction of the tetanus bacillus. The tetanus bacillus is a little delicate rod, somewhat like the bacillus of septicemia in the mouse. One end of the bacillus shows a sharply defined shining spore.



FIG. 13.

(Fig. 13.) Artificial cultures are difficult. Tetanus has been proven to arise from this germ by its being administered to mice in very small doses, it causing their death by tetanic spasms. It abounds almost everywhere. The symptoms of infantile tetanus are acute, and are first manifested by inability to properly nurse the nipple. The facial and jaw muscles refuse to respond, and gradually increase in rigidity until the jaws are permanently locked. At first the symptoms are confined to the

jaws and face, but as a rule complete tetanus will soon set in and death quickly terminate the scene. Jaundice attends upon trismus and has been charged with its fatality, whereas icterus is but a result, not a cause. The temperature is usually excessively high, 105° to 106° , and the child's skin is quite red unless jaundice be present. On the other hand cases are met with where the nerve shock is so severe as to cause an unusual degree of pallor. Cerebral effusion results upon brain involvement and convulsions occur; these are increased in severity and frequency from sudden shocks, as the slamming of a door, or like noise, and from the dorsal decubitus. *The newly born infant should never be allowed to lie upon its back.* By preference it will lie almost constantly on its right side during the first two or three weeks of life. The

bacillus tetanus attacks the nerve centers and causes congestion of the brain, with subsequent effusion into the membrane and even into the pleural and mediastinal sacs.

Umbilical sepsis has already been spoken of as a cause of trismus neonatorum, and other constitutional states, and it is interesting to note in this connection that of 1,000 cases recently observed in the obstetric clinic at Buda-Pesth fever was present in 450 of the cases, in eighty-one being traceable to gangrene of the cord, in fifty-five to sloughing, in fifty-five to protrusion, and in twenty-four to omphalitis. Gangrene of the umbilicus occurred in two cases, and ulceration in three infants. Death resulted in eight cases of the 450. This sufficiently emphasizes the necessity of proper attention to the cord and navel, so often overlooked by the physician and unattended to by the nurse.

PROPHYLAXIS.—Tetanus is a preventable disease, but when once on is almost invariably fatal. Efforts at its prevention will consist in the proper dressing of an umbilicus showing the least indication of foulness. If proper cleansing cannot be accomplished by the free application of sterilized water, and subsequent drying with absorbent cotton, the peroxide of hydrogen should be used to cleanse the navel fossa, and a weak solution of carbolic acid or bichloride of mercury should be used until such time as the navel is perfectly free from odor and the child is well.

TREATMENT.—The treatment of tetanus in infancy has not been attended by satisfactory results. In the first place, when that degree of sepsis has taken place that results in tetanic manifestations the danger line will already have been reached. The very youthfulness of the subject, and its utter inability to resist the violent nervous shocks incident to trismus render a fatal prognosis almost invariably certain. The seriousness of the disorder is enhanced by the inability of the infant to take nourishment, so that even should it be able to survive the convulsions by the time they will have subsided under treatment, if, indeed, this be possible, the child will be in such an exhausted condition from lack of food as rarely to be able to rally. It must, therefore, be borne in mind that while efforts are being made to overcome the spasms rectal alimentation, by the introduction of two or three teaspoonsful of equal parts of bovine and milk every two or three hours by rectal enemata should be practiced. It may be necessary, even, to feed by way of the stomach, pending a possible favorable outcome, by the introduction of the gavage tube through the nose.

The remedies to be thought of in the treatment of trismus are those having cerebro-spinal nervous symptoms, as *Gelsemium*, *Belladonna*, *Cuprum*, *Cicuta*, *Nux vomica*, *Hydrocyanic acid* and other remedies of this class.

Nux vomica is useful in tetanic convulsions of the clonic variety, when alternating with tonic spasms. The convulsions are

frightful and the opisthotonos extreme. This remedy is especially to be thought of if consciousness is retained, no matter how severe the spasms. There is distortion of the eyes and face, and dyspnea from spasm of the chest muscles.

Caprum is useful when there is paleness of the face, with subulcus, contraction of the jaw, frothing at the mouth, jerking of the limbs and severe opisthotonos, the patient losing consciousness with each spasm.

Stechinus may be found useful in a spasm calling for *Nux* twice, when it is unusually severe and *Nux* fails to relieve.

Belladonna is particularly adapted to the tetanus of infants. There are twitchings, sudden startings, dilated pupils, motionless, staring eyes, strabismus, and severe convulsions. Opisthotonos and pleurothotonos, especially of the right side. In tetanus affecting chiefly the jaw and throat, with firm rigidity of the throat muscles, and manifest evidences of contraction of the throat in infants, *Belladonna* will be found especially applicable.

Hydrocyanic acid has persistent clonic and tonic spasms, severely oppressed respiration, with frothing and foaming at the mouth, livid countenance and violent contraction of the diaphragm. The pulse is small and frequent, there is firm rigidity of the limbs, and the body is bent backwards.

Pisiciflora is among the new remedies that have been highly recommended for tetanus, more especially, however, when occurring from wounds; but since all cases of this spasm have been proved to be caused by its peculiar bacillus it is not clear just why it should be recommended in connection with punctured wounds particularly. It has extreme rigidity of the muscles of the neck and shoulders, the peculiar sardonic smile and cry of tetanus, together with difficulty of swallowing and severe opisthotonos.

Hypericum is a remedy of much value in trismus arising from direct injury to nerves. It is said to be prophylactic to trismus occurring from wounds in the palms of the hands and soles of the feet, if given steadily from the time of the injury. If this be true it should be administered as a prophylactic remedy in new-born children whose navels present unhealthiness.

Gelsemium has spinal convulsions and paralysis, with consciousness to the end. The head is drawn backward. The lids are swollen and the pupils are dilated. Spasmodic contractions of the muscles of the throat occur, making swallowing difficult. *Gelsemium* is especially applicable in cases manifesting extreme traction following each convulsion.

Cicuta is another remedy whose pathogenesis shows utter prostration, with deathly paleness of the face and coldness of the hands and feet. Spasms are renewed by touching the child or in any way startling it when quiet. The child froths at the mouth, the face becomes dark red during the spasm, and the muscles of the

chest and neck are involved in the convulsions, rendering breathing exceedingly difficult. The child is violently contorted, and suffers from jerkings and twitchings of the entire muscular system.

Besides these remedies *Camphora* may be called for when there is deathly coldness all over the body. *Physostigma*, *Stramonium*, *Hyoeyannus*, *Zincum*, *Arnica*, and other remedies may also be studied to advantage.

Arsenicum is especially to be thought of when sepsis is pronounced. With the spasms there are frightful contortions of the limbs. The patient lies like dead, but is warm. The hands are clenched and the features are distorted. Breathing is hardly perceptible, and there is frequent sinking of strength upon relaxation from spasm. The more pronounced the septicemia the more likely is *Arsenicum* to be indicated.

It is doubtful if local measures are of much avail when once the spasms are on. Hot baths and the hot pack, especially the latter, have been often useful in individual cases. The continued hot bath, that is, keeping the child for hours at a time in the bath, having the bath just as hot as can be well borne by the constant addition of hot water, has been pronounced successful in individual instances. The old school recommend *Opium*, *Cbloral*, *Bromide of Potash*, *Cannabis Indica*, *Chloroform*, etc., but offer little encouragement under their treatment. With the growth and development of sero-therapy the treatment of tetanus by the anti-toxine practice, carrying the bacillus tetanus through successive cultures and administering it hypodermically, is being recommended. Pasteur has reported this line of treatment as having been used by him with success.

Other Diseases of the New-Born.—Besides the diseases already described there are infectious diseases of the new-born child that are deserving of passing notice. Certain surgical conditions will be treated of in connection with the Surgical Diseases of Children.

Hematoma of the sterno-mastoid occurs from too active interference on the part of unskilled physicians or midwives in delivering breech presentations. Undue traction upon the muscles of the neck results in injury to them, the blood oozing from their vessels and resulting in effusion under the sterno mastoid, causing tumors of varying size, generally about the size of a pigeon's egg and about that shape. They are often mistaken for an enlarged gland. Absorption occurs within a few weeks or months, and unless the injury to the muscle has been so severe as to cause cicatrization no bad result follows.

Active fatty degeneration is a rare disease of infancy. Children suffering from it are generally born more or less asphyxiated and die at birth or shortly after. Should the child be born alive there will be cyanosis, tendency to hemorrhage of the bowels,

jaundice and blood extravasations. This disease is very peculiar and inexplicable, and is mentioned here historically only.

Weinckel's disease is similar to fatty degeneration. It is characterized by cyanosis, jaundice and blood in the urine. Cyanosis generally sets up on the third or fourth day, when the urine becomes brown in color; there is quite apt to be diarrhea and vomiting, also. It is supposed to arise from thrombosis from the umbilical vein, or from embolism in the vessels of the stomach and intestine.

Hemorrhage may occur in almost any organ, or from almost any outlet of the body, and result disastrously if excessive. Syphilis is one of the most frequent causes of the tendency, and small pox, typhus, typhoid and scarlet fever occurring in the mother during the pre-natal life of the child are the cause of hemorrhage into the brain, kidney, spleen and other organs. The child that suffers severe blood effusions before or during birth is quite apt to succumb to pneumonia or inflammatory diseases of the affected organ within a few days. The knowledge of these occurrences in utero is chiefly valuable because it enables the physician who has the obstetric case under surveillance throughout the entire period to institute such treatments of the mother as will best conserve her health and that of her offspring.

SECTION II. GENERAL DISEASES.

CHAPTER VI. TUBERCULOSIS.

General Considerations—The Bacillus—Acute Military Tuberculosis—Typhoid Type—Pulmonary Type—Tubercular Adenitis—Tubercular Mesenteritis—Intestinal Tuberculosis—Pulmonary Tuberculosis—Chronic Lung Tuberculosis.

General Considerations.—General tuberculosis in infancy, as the term implies, is by no means confined to tubercular deposits in the lungs, its commonest seat. The tuberculous process affects almost every organ and tissue of the infant organism, its general distribution sometimes rendering diagnosis very difficult. When tuberculosis is localized, as in the lungs, brain, local glands, skin, or the heart even, it is much more easy of diagnosis than where the distribution is so general as to involve not only these organs but the glands of the mesentery, mediastinum, peritoneum, intestines, and the liver, spleen and kidneys.

This general form of tuberculosis is not common in earliest infancy, that is, in the first few months of child-life; but, on the other hand, it is not at all uncommon in the second and third year. It has been estimated that in the infant department of the Paris hospitals about twenty-one per cent of babies die of tuberculosis; and all the large cities of the old country show considerable mortality from general tuberculosis in the first five years of child-life.

The subject of hereditary transmission will not be considered extensively in this volume. It is no longer doubted that while occasionally tuberculosis is directly transmitted from parent to child, this is of far less common occurrence than has long been supposed. Transmission seems to consist of the tendency alone, or the transmission of a tissue-soil favorable to the development of the disease, if from any cause it shall be accidentally introduced into the system. The distinction is a fine one and yet an important one. Congenital tuberculosis is almost altogether limited to offspring whose mothers are far advanced in the tubercular process during their intra-uterine life. And even here it is remarkable how many women are delivered of vigorous, apparently healthy

children who live out the full term of life, the mother succumbing to consumption almost immediately upon the birth of her child.

Some authors have contended that the "virus" is directly transmitted to the child but lies dormant until some critical period in its history, as the age of puberty, or, in the female sex, the child-bearing period, when it may develop; but, fortunately for the human family, it has come to be pretty well understood that children born of tubercular parents, while not having as good a chance for perfect health and long life as those of sturdy stock, are yet capable, under proper hygienic and climatic surroundings, of entire elimination from their systems of the tendency to the development of the disease in later life.

Local transmission may come from inoculation and from the introduction of the bacilli of tuberculosis by means of wounds, abrasions or sores, and also by vaccination and other means of direct introduction. The introduction of the disease may also occur by the inhalation of its germs from atmosphere which has been contaminated by the wide diffusion of dried sputum, from consumptive patients. It is not necessary to elaborate upon this thought, since evidences of infection by inhalation, both in adult and child-life, are to be found on every hand. Especially is the danger great when the association of an infant or young child possessed of hereditary tendency is close with another child or with an adult far advanced with the disease.

Transmission occurs also by food, and it is now an accepted fact that one of the most common causes of the development of tuberculosis in young subjects is systemic infection by means of milk. Experiment stations are revealing to our understanding only too emphatically that tuberculosis is a wide-spread condition among the higher grade of milch cattle. Even when the disease is localized in the lungs, whether human or bovine, it is possible for its germs to be transmitted through the milk. Investigations with the microscope and experiments with the culture-tube have shown that milk infection is of very common occurrence, and it is easy to understand that this is so when it is remembered that as high as from ten to fifteen per cent of the dairy stock of the East is asserted by Osler to be tuberculous. It will at once be seen that there is very great necessity just here for extra care in the selection of a milch cow from which milk is to be obtained for young infants; and it is not easy to justify the acceptance of milk from a herd of cattle, of which but one or two or a few may be diseased. The entire milk supply from that dairy is contaminated if a single cow is tuberculous. But few dairies, and, indeed, but few farm homes are there but that have scrawny, feverish, emaciated, tuberculous cattle in their milk pens.

The conditions formerly known and treated of as scrofulous are undoubtedly tuberculous. The development of so-called

"scrofula" in children is usually local at first, affecting chiefly the glands of the neck, the bony system and the skin. Tubercular adenitis is quite common in children of tuberculous dyscrasia, who are ill-nourished and otherwise unhygienically situated. Caries of the tibia or of the ribs, knee-joint involvement of tuberculous character, and suppuration from the ears, are most often of purely tuberculous origin, and all came formerly under the general heading of scrofula. It has been thought the difference between this localized and rather non-fatal form of the disease and general tuberculosis, with destructive outcome, is due to a milder form of infection, perhaps to the existence of an attenuated virus; but this conclusion is strained, and the "scrofulous" state is probably due to the fact that the disease is localized because the transmission of tissue tendency is localized; for it is not unreasonable to suppose that in her economy nature may not have allowed herself to be invaded equally with tuberculous-harboring tissue. However, no matter what the theories, it is now so well known that scrofula is not a distinct disease, but purely a tuberculous condition, that it is no longer deserving of separate consideration. It is rather unfortunate that in the nomenclature of medicine the words "scrofulous," "tuberculous" and "strumous" are used synonymously and indiscriminately in relation to diatheses. Should they appear throughout this volume it must be understood that in every instance the words scrofula and struma are used adjectively, and invariably relate to tuberculosis and its pathological conditions.

The Bacillus.—The tubercle bacillus, demonstrated by Koch to be invariably associated with the tuberculous processes, and

presumably its cause, is a slender rod, in length about one-third the diameter of the red blood corpuscle. It is about one-fifth as broad as long, varies somewhat in size, and is usually slightly curved, though sometimes perfectly straight. (Fig. 14.) It is accounted an aerobic, although somewhat difficult to cultivate; is grown in blood serum, glycerine agar and potato agar. It is sometimes apparently broken in its long axis by refracting globular spaces, four to eight in number. These are regarded as the spores, and in acute tuberculosis an examination of the sputum will show the tubercle bacilli to contain them in large numbers. When the process is slower, and perhaps not developing at all, these spores are seen to be absent from the bacilli. If cultivated, the tubercle bacilli develop in colonies,



FIG. 14.

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presenting the appearance of dry, grayish white, scale-like masses, as shown in the foregoing figure. It is claimed that, in developing, tuberculous bacilli, like many others, form certain soluble products or toxins, and chemically it has been demonstrated that the introduction of these into the system develops symptoms and lesions similar to those caused by the bacilli themselves.

The tuberculous bacilli are among the most tenacious of the micro-organisms belonging to human diseases. They have been shown to be living two years after the burial of subjects whose deaths have been caused by consumption. They develop much more rapidly in the presence of heat and moisture, but are effectually destroyed by boiling; hence the safety of the sterilization of milk as a food. The tubercle bacilli are found in all tissues suffering tuberculous process. They belong to the caseous form of consumption, are found in the fibrous form of the disease, exist in the acute miliary nodule, and abound in all ulcerous and tuberculous pulmonary lesions. They are not so plentiful in bones and glands. It is recommended that where destructive disease of glandular tissue or bone exists and it is impossible to demonstrate the presence of the bacilli by histological methods, the inoculation of animals, as rabbits and guinea pigs, be practiced for diagnostic purposes.

The most common cause of the spread of tuberculosis is the infection of susceptible individuals by the inhalation of the dried sputum containing bacilli, from the expectoration of a consumptive. While dryness and heat combined tend to prevent their rapid development, and act curatively in a great many cases of incipient tuberculosis, yet it is possible for the bacillus to retain its vitality in the form of dried sputum for several months, especially if sporulation be active at the time of expectoration. Hence the wisdom of measures looking to the immediate destruction of every particle of sputum thrown off by consumptive patients, and the additional wisdom of the practice of the best possible hygienic measures by those whose attendance upon consumptive patients is necessary, as well as the isolation of advanced tuberculous subjects, in so far as this is humanely possible.

Acute Miliary Tuberculosis.—This type of tuberculosis runs a very rapid course, and is much commoner in early life than in adult years. It is common to all periods of child-life excepting very early infancy. It is not often witnessed in children of robust habit and good parentage, being much more common to those predisposed by birth to general tuberculosis. I have seen it more often in mulattoes than in whites or negroes, and have noted in my personal experience that it occurs in the second seven years of life more often than earlier. It may present in two forms; the typhoid, in which the symptoms of typhoid fever are so closely simulated as to make differential diagnosis in the earlier days of the disease quite difficult, and the broncho-pneumonic form, in which the

course of the disease is not unlike that of acute erosive pneumonia. This pulmonary type is much more common than the typhoid and is very apt to follow upon whooping-cough or measles, especially the latter.

Typhoid Type.—The *typhoid form* comes on insidiously, much like the ambulatory form of typhoid, beginning with slight indisposition and tired feelings, with headache and perhaps some slight shiverings, followed by feverishness in the afternoon or evening, common with loss of appetite and general languor; the child shows an indisposition to play and is manifestly ill. Dryness of the membranes occurs, the fever induces constipation usually, in the first stage, and there is persistently present a dry, teasing, hacking cough, worse as the fever heightens. Instead of constipation there may be a good deal of gastro-intestinal disturbance and nausea, heavily coated tongue, foul and feverish breath, rumbling, distension, pain in the abdomen and diarrhoea setting in early. If these symptoms manifest themselves there is less likely to be bronchial irritation and the case is more apt to be ushered in acutely with perhaps only a few days or a week of prodromal symptoms. The spleen is swollen and sensitive to pressure, the liver is tender and the intestines are distended and sore. In the early part of the second week there may present a petechia over the chest and abdomen which is misleading, and which, coupled with the general glandular enlargement and soreness, the evening aggravation of fever, the headache, languor and muscular soreness, makes a fair picture of the typhoid state and gives to this type of the disease its name. The differential diagnosis is arrived at by the marked variation of morning and evening temperature range. The morning register is usually down to about normal, sometimes even sub-normal, while the afternoon mark may be touched at as high as 104° or $104\frac{1}{2}^{\circ}$. The intestinal symptoms also assist in making up the diagnosis, there being far less likelihood of the presence of the pea-soup diarrhoea with ilio-caecal tenderness and gurgling; besides, by the end of the first or middle of the second week the more characteristic symptoms begin to show themselves. The cough increases, it is hard, dry and hacking, especially at night; crepitant or sub-crepitant rales are heard at the apices and bases of the lungs, and percussion and auscultation will reveal either extensive hepatization, with a sub-tympanic note, or effusion of liquid in the pleural sac, and perhaps the well known pleuritic friction sound. The shortness of breath and difficulty in breathing are out of proportion to the pulse rate and fever. Hectic symptoms, as shiverings, high fever and sweats, with headache and burning of the cheeks, very hot hands and feet, occur in most cases with the full development of the disease, and usually by the end of the second or middle of the third week the case will be so clearly one of acute tuberculosis

that it will be difficult to make a mistake in diagnosis. If expectoration occurs microscopic examination will, of course, make the diagnosis clear; but with young children this is not apt to happen, the destructive process being generally one of acute combustion.

I have seen this form of tuberculosis run a destructive course in young children within ten days' time. Usually, however, it is a disease of six or seven weeks' duration, and is terminated by the development of acute tubercular meningitis or perhaps bronchopneumonia.

Pulmonary Type.—This is rather more easily diagnosed. The onset is sudden, beginning with a chill, generally, the fever soon bounding up to 103° or 105° , and the pulse reaching one hundred and thirty to one hundred and forty beats per minute. Respiration is very rapid and labored and the cough is incessant, dry and painful. In young children the face and chest early show cyanosis, due to capillary congestion, and it is easy to be seen within a day or two after the development of the symptoms that the child is very ill. It occurs most often in children from two to five years of age, and is to be differentiated from acute bronchopneumonia, whose symptoms and course it simulates very closely in the fever, shortness of breath, cough, pain, and crepitant rales which are heard over a considerable area of lung tissue, with more or less corresponding impairment of resonance. The disease is very acute in its course, terminating usually in ten or twelve days, death generally ensuing from exhaustion or gradual asphyxia, because of the rapid impairment of the pulmonary function from acute development of miliary tubercles throughout the entire structure of the lungs, which become, as it were, a solid mass of miliary granules; and, as in the typhoid form, this type may be terminated suddenly by the development of acute meningitis.

It is necessary to differentiate acute miliary tuberculosis of the pulmonary type from the more acute cases of general systemic tuberculosis. In the latter form of the disease, which may in unusually rapid cases terminate life in from six to eight or ten weeks, the general symptoms of consumption are present; and as the disease progresses expectoration ensues and cavities form in the lungs, the mesenteric glands become involved and diarrhea sets in. Caseous masses are also known to occupy the liver, spleen and kidneys, and while miliary tubercles may be present this type of case partakes of the character of general tuberculosis and not of the acute miliary form. And yet, after all, they are about equally fatal in young subjects, and as the treatment of both must be symptomatic the importance of a close differential diagnosis is not very great.

Prognosis.—Acute miliary subjects die. Some authors contend that occasional cases are recognized in which if the

miliary tubercles are not widely disseminated recovery may possibly ensue, but the general outlook is so desperate that an unfavorable prognosis is always justifiable. In an experience extending over a good many years in a section of country exceedingly favorably known for its climatic advantages, and consequently largely availed of as a place of residence by tuberculous families, I have witnessed a great many cases of acute miliary tuberculosis and all have died. I have no doubt but that special instances occur in children predisposed to tuberculosis wherein symptoms very like unto those belonging to miliary tuberculosis may develop and be overcome; but typical cases of the miliary form of this disease are so uniformly fatal as to justify in general the expression of a most unfavorable prognosis in every case.

Tubercular Adenitis.—The lymphatic glands are commonly the seat of tuberculous deposit. Gland enlargement and induration in children predisposed to tuberculosis are very common conditions, the enlargement being caused by the lodgment in these glands of infective matter coming up in the lymph stream. Usually those nearest the seat of trouble are most apt to be involved, but sometimes remote glands may be enlarged, and thus adenitis be rendered misleading. Where there is general enlargement of the superficial lymph glands there is usually an unhealthy appearance of the child, with large, glassy eyes, anemia, capriciousness of appetite, slight hectic symptoms and progressive cachexia.

The cervical glands are perhaps most often affected. The superficial cervical and the deep cervical, as well as the sub-maxillary, are both enlarged and indurated. General enlargement and suppuration of the glands of the neck were the most common symptoms of the "scrofula" of early writers. It is contended by some authorities that the frequent involvement of these may be due in part to the inhalation of noxious germs, and infection of the glands in immediate proximity to the mouth and throat from this cause. It is more likely, however, that they are enlarged from systemic infection, serving as they do as receptacles for noxious products from the brain, upper portions of the lungs and the vertebrae. The glands of the trachea and bronchial tubes are perhaps next most often involved. In fact, in a large proportion of the cases of tuberculosis in children the tracheo-bronchial glands are the seat of the disease. The disease may present as gray miliary tubercles, as large, cheesy areas, with foci of softening, with suppuration, or as old calcified masses. The tracheal glands may be involved alone but more likely the glands of the trachea and bronchi are equally affected. Abscesses may form and considerable suppuration ensue. Interference with the circulation may result upon compression of the vena cava or pulmonary artery, and the recurrent laryngeal branch of the pneumogastric nerve may be involved. Perforations of the esophagus have been recognized,

and even the pulmonary artery has been fatally involved by destructive process. These glands are almost invariably involved when the apices of the lungs are the seat of disease, but the tuberculous process may affect them quite independently of disease of the lung tissue and disaster come to the patient without invasion of the lungs at all. As showing the possible mode of infection of various glands of the body the appended table, taken from Ashby & Wright, is given to illustrate the distribution of the lymphatic glands and their drainage areas:

TABLE SHOWING THE DISTRIBUTION OF THE LYMPHATIC GLANDS AND THEIR DRAINAGE AREAS.

HEAD AND NECK.	
Glands.	Drainage Area.
Sub-occipital.....	Drain posterior half of head.
Occipital.....	
Parotid.....	Drain anterior half of head, orbits, nose, upper jaw, upper part of pharynx.
Sub-maxillary.....	Drain the lower jaw, lower part of face, and front of mouth and tongue.
Supra-hyoid.....	Drain anterior part of tongue, chin and lower lip.
Superficial cervical (lying beneath platysma).....	Drain external ear, side of head, and neck and face.
Retro-pharyngeal.....	Drain nasal fossae and pharynx (upper part).
Deep cervical:	
Upper set along carotid sheath.....	Drain mouth, tonsils, palate, lower part of pharynx, larynx, posterior part of tongue, nasal fossae, parotid and submaxillary glands, interior of skull, and deep parts of head and neck.
Lower set in supra-clavicular fossa.....	Drain upper set of lymph glands, lower part of neck, and axillary and mediastinal glands.
UPPER EXTREMITY.	
Supra-condylar.....	Drain three inner fingers.
Axillary.....	Drain upper extremity, dorsal and scapular regions, front and sides of trunk and breast.
LOWER EXTREMITY.	
Anterior tibial and popliteal.....	Drain the deep lymphatics of the leg, and receive some vessels from the skin of the leg and foot, chiefly the outer side.
Inguinal:	
Femoral set (superficial).....	Drain superficial vessels of lower limb and partly of buttock and genitals, also penis.
Horizontal set (superficial).....	Drain abdomen below umbilicus, buttock, and genitals.
The deep vessels of the lower limb go to the deep glands along the femoral vein.	
Iliac.....	Drain the pelvic viscera and the deep vessels of the genitals partly.
Lumbar.....	Drain all the lower glands, uterus, testes, ovaries, kidneys.
Sacral.....	Drain the rectum.
Roughly, the umbilicus is the watershed draining to the axilla and groin, but the vessels cross and overlap both vertically and horizontally.	

SYMPTOMS.—The enlargement of the lymphatic glands, if acute, is attended by pain, headache, fever, rigors and more or less gastric disturbance, depending upon the acuteness of the invasion and the susceptibility of the child. In perhaps the majority of instances there are no disturbances of this character and only the deformity of glandular enlargement calls attention to the case. The glands form hard, rounded or oval masses, and are usually movable. They may vary in size from a pea to a pellet's egg. Sometimes a single gland is the seat of enlargement, but usually careful examination will reveal involvement of the neighboring glands as well. In occasional cases where the involvement is extensive there are irregular attacks of dyspnea, with alternate very rapid and slow heart beatings, cyanosis and cold sweats, with difficulty of breathing so pronounced as to simulate spasmodic croup, these latter symptoms usually following upon the taking of cold. Difficulty in breathing may arise from compression of the trachea or bronchii, as the glands of these tubes and neighboring glands are very much enlarged. If the parotids and cervical glands take on the inflammatory process suppuration may ensue, making incision necessary, with destruction of more or less glandular tissue as the certain result. In ill-nourished children living in unsanitary homes in whom glandular suppuration occurs there may be a more or less permanent discharge, a "running sore" which may continue for years. These suppurations are sometimes quite extensive and leave unsightly scars about the angle of the jaws and behind the ears. If the bony system is involved the old-fashioned white swelling, or caries, is seen, with its characteristic sanious discharge and occasional off-throwing of specks of bone. These glandular and osseous suppurations will be considered surgically in their proper chapters.

Tabes Mesenterica.—The glands of the mesentery are another site of tuberculous infiltration. In general tuberculosis they are nearly always enlarged and caseous. In slight tuberculous affections of children the involvement is not extensive. In children who have been the subjects of chronic intestinal catarrh and general malnutrition, the subjects of marasmus, the abdomen is sometimes enormously distended, tympanitic and generally painful upon deep pressure. In pronounced cases, where the emaciation is great and the distention enormous, nodulation may be felt, in other instances this will be absent. There is generally present diarrhea and gradual emaciation. The muscular tissues suffer especially; the skin hangs in great folds over the bones of the lower limbs and every rib of the body shows, the belly being distended greatly and its integument being invariably hot and dry. If there be no tuberculous involvement of the intestinal glands the case may drag along in a pitiful condition for many months. On the other hand, if tuberculous ulceration of the bowel is present, a

fatal issue may ensue within a few weeks. The modulation spoken of is more apt to be noticeable where the peritonium is also involved, and where the fever is not as pronounced nor the diarrhea as severe as where the intestinal glands suffer most severely.

Intestinal Tuberculosis.—Primary tuberculosis of the intestine is not a common condition. It is almost invariably associated with the general presence of tuberculosis, and the intimacy of its association with mesenteric tuberculosis is universally recognized. It occurs in infants and children of all ages, but is much more often seen above the second year. The general atrophy of infants is not usually due to tuberculous disease, but a not uncommon termination of their cases is the late setting up of tuberculous ulceration of the intestinal glands. In perhaps seventy-five per cent of cases of children dying of tuberculosis the mesentery is involved, and in at least one-half of cases resulting fatally tuberculous ulceration accompanies. Where primary tuberculosis of the intestine occurs it may be said to be axiomatic that the infection has been local by means of milk, whether from the mother, wet nurse or cow.

Tuberculosis of the intestine is characterized by looseness of the bowels, wasting and hecticness, distention of the abdomen with enlargement of its superficial veins, tenderness on deep pressure, and, perhaps, thickening over the cecal region. The tuberculous ulceration is usually found to be transverse to the long axis of the bowel, irregular in outline, with infiltrated, often cheesy base. It involves not only the mucous coat but the entire sub-mucous and muscular tissues are also involved, and the lymphatic glands in the immediate proximity are generally the seat of infiltration. The walls of the cecum are generally thickened, and the ulcers are sharply punched out. They may cicatrize and pucker the intestine and thus give rise to some obstruction. In most cases of tuberculous ulceration there is diarrhea. It is usually persistent and painful, generally present from the start, and sometimes accompanied by hemorrhage. It is not often that gastric symptoms accompany, but there is usually lack of appetite or capriciousness of appetite, emaciation takes place rapidly, and as it occurs the distention of the abdomen is made more noticeable. The history of tuberculosis will assist in making the diagnosis clear, and the presence of local indurations in the cecal region and in other places will be of service in this connection.

General infantile atrophy is perhaps the only condition with which tuberculous ulceration of the intestine is likely to be confounded. The former is due to non-tuberculous gastro-intestinal catarrh, while the latter is almost invariably associated with tuberculous parentage. In the early stage of the disease it may be confounded with enterocolitis, but as other organs and tissues of the body become involved the diagnosis will be cleared up.

Pulmonary Tuberculosis.—Pulmonary tuberculosis is seen in children of from a few months to five or six years of age, not as acute lobar pneumonia, but as tuberculous broncho-pneumonia. It is much more common in public institutions whose inmates are orphaned by tuberculosis, and is especially common among double orphans. It follows very often upon undeveloped cases of measles, especially those in whom bronchial catarrh has been pronounced during the presence of rubeola. Whooping cough is one of the most common causes of the development of tuberculous conditions in children. It is not likely that this is more from pertussis than from the fact that it is children of tuberculous dyscrasia who have suffered from its ravages, and in whom it seems to light up the tuberculous disease. The development of tuberculosis in the lungs is also secondary to local tuberculous states, especially those of the bones and glandular system, the old-fashioned *scrofula*, for instance. The tubercular condition in child-life is much more likely to be widespread throughout the lungs than in adults, where the process commences by consolidation at the apices and gradual downward extension occurs. The pathological state upon death is practically the same. Cavities will be found, the connective tissues are infiltrated, large cheesy masses appear here and there, and the presence of the gray tubercle of Niemeyer and other authors is clearly proven. The bases of the lungs are much more apt to be affected in child-life, however, than the apices, and the bronchial glands are so often the seat of the trouble that the title "tuberculous broncho-pneumonia" is used instead of the ordinary appellation, pulmonary tuberculosis. It is not always easy to determine that broncho-pneumonia in children is due to bacillar infection, yet the microscope almost invariably shows the presence of the bacilli. Whether these are the result of caseation, excited by the existence of other diseases, as measles, whooping cough, etc., or whether they have been introduced into the system from without to find ready lodgment and a fertile field because of previous existence of other disorders, and the additional existence of proper infection-soil, due to the child's genealogy, is still an open question.

The onset may be insidious or sudden. If the latter the case usually presents as an acute broncho-pneumonia, more especially as the sequel of some infectious disease. There will be a chill, or chilliness and repeated shiverings, followed by fever, which is persistent, lasting about equally throughout the day, although the thermometer range is not above 101° or 102° usually. Shortness of breath and cough are always present, and the cough is distressing, being of a dry, teasing, persistent character, with headache and pain in the chest. The physical signs, as shown by percussion and auscultation, are usually found at the base or central portion of the lungs, although they may show at the apices. There

is also some dullness and moderate resonance over the affected areas, with perhaps consonant rales or crepitation. Later there are moist rales, and the cough sounds loose and as though the tubes were filled with mucus, but because of the patient's age expectoration is generally not practiced. The continuance of the fever, which, after a few days, is followed by sweatings, especially at night, and more about the head and chest, the rapid emaciation, with soreness of the muscles and integument, the failing appetite, the glassiness of the eyes, the enlargement of the glands about the neck, usually present but not always, with the increasing dyspnea, will early make the diagnosis clear. In a good proportion of cases besides the absence of appetite there will be nausea and sometimes vomiting. Diarrhea accompanies very often, and stomatitis, hectic and edema of the extremities are also present. There is little likelihood of confusing pulmonary tuberculosis in children with anything else. Empyema following pleurisy or pneumonia may be mistaken for pulmonary tuberculosis, and effusions into the pleural sac or pericardium that set up fever, anorexia, emaciation and cough, may so closely simulate the tubercular disease that only the outcome of the case will clear up the diagnosis.

Lung tuberculosis in children runs its course in a few weeks. The younger the child the briefer the duration of the disease.

MORBID ANATOMY.—As stated, the tuberculous deposits are much more likely to occupy the bases and central portions of the lungs than the apices. The lymphatic glands of the body, especially those of the cervical region and mesentery, are much more apt to be involved in the process than in adult life. Tubercular hepatization accompanies pulmonary consumption in adults much more commonly than in children, caseation or cheesy down-breaking being more the rule with children. The nobler glands of the body, as the liver, kidneys, spleen, are much more apt to be the seat of tubercular processes in children, and the peritoneum and intestines are more likely to suffer also. It is rare to find cerebral effusion in adult life, while tubercular meningitis with effusion is very common in children. In occasional cases the central portion of the lungs will be quite solid, from the involvement of a large number of lobules rather than from hepatization of individual lobes. If the condition has gone on to caseation cavities will have formed, and these and the cheesy masses may show the mixed infection of the tubercular bacilli and streptococci, staphylococci and pneumococci, in children the subject of latent tuberculosis that is lighting up or that has been lighted up by measles or whooping cough, or other infectious disease of child-life. The general tuberculous process may have been begun prior to the development of the broncho-pneumonia; but clinically the rule is, that, given a child with proper transmission-soil, and a violent or undeveloped case of measles or whooping cough, broncho-

pneumonia is apt to follow upon the presence of these diseases, especially, and it may follow upon scarlet fever or diphtheria, and the case drift on into one of general pulmonary tuberculosis.

Chronic Lung Tuberculosis occurs in plithically predisposed children after the seventh or eighth year, and not uncommonly about the age of puberty. Here it is much more likely to present the symptoms and course common to consumption in adults, especially in early adult life. The child of tuberculous parentage may have been suffering drainage of the system from gradual suppuration, or with septic symptoms and chills and fever, sweats, diarrhea, and some failure of health. Perhaps the case has not been so marked as this; but as the child grows taller it becomes more slender and delicate. There is unnatural fineness of the hair, with abnormally bright or glistening appearance of the eye; the appetite increases in capriciousness; the child is tired and languid; a slight cough sets up, at first dry and short and comparatively insignificant, but soon becoming persistent and looser; the cough is always worse upon lying down; it may come on in paroxysms and thus be mistaken for whooping cough. The fever is remittent and the thermometric gradations are not very marked. These children sweat at night, especially about the head, neck and upper part of the chest. They are not disposed to play, and cannot partake of the active games of childhood because of shortness of breath. Their skin is transparent and the veins are large and blue, and as the symptoms go on there will be decrease in strength and great increase in cough, expectoration of a yellowish mucoid character will occur, the heart's action will be gradually more rapid, and it suddenly dawns upon the parents or guardians that the child is going into a decline.

PHYSICAL EXAMINATION.—Attention having been attracted to the state of the health inspection shows a flat chest with wide intercostal spaces. If the child has been the subject of nasopharyngeal catarrh, with enlarged tonsils, the deformities of the chest due to mouth-breathing will be seen. The collar-bones stand out prominently, the child is chicken-breasted. If but one side is involved it will be easy to detect corresponding immobility of that side of the chest, because of its flatness and the width of the space between the ribs. Percussion will show a loss of resonance beneath the clavicle amounting to dullness, and if consolidation is extensive this will be so pronounced that the percussion note is positively flat. If the tubercular diffusion is extensive but hepatisation is not yet pronounced little clinical testimony will be given by percussion. The ear will reveal the signs of bronchial catarrh, and if the case has progressed far enough to have reached the stage of expectoration moist rales will be heard more or less plentifully over the involved area. If percussion has revealed extensive dullness the respiratory sounds are harsh, more after the

bronchial order. Auscultation alone is apt to be confusing. The cavities in pulmonary tuberculosis in child life are very small, and the sounds attendant upon diffused bronchitis are so like those of caseous degeneration that it is necessary to exercise care in order not to confuse the two diseases. After all, the diagnosis of chronic pulmonary tuberculosis in children will depend more upon the general course of the case and the general constitutional symptoms than upon the physical signs. The diagnosis is usually not very difficult, because of the continued character of the fever, the progressiveness of emaciation, the glandular involvement, which, however, is not as marked as in acute tuberculosis, the persistence of cough, the glassiness of eye and the general hectic, all of which are, as a rule, grafted upon a tuberculous family tree.

The general course of this disease in children is about the same as in adult life, excepting that it is much more rapid; just as acute tuberculosis carries off children of from one to five years of age even more swiftly than galloping consumption destroys young adults, so chronic pulmonary tuberculosis in children of from seven or eight to fourteen or fifteen years of age carries off its subjects more quickly than chronic pulmonary tuberculosis destroys them in adult age. The course of the disease is not always uninterruptedly downward. There may be at times symptoms of marked improvement, and the parents are misled to believe that the child is about to recover, when aggravations will occur which will carry him further down the hill than prior to the amelioration. More often there is a steady downward course, the fever gradually increasing, the cough becoming worse steadily, the night sweats growing more profuse, and the shortness of breath gradually becoming more distressing. Emaciation goes on rapidly, and in the last weeks of life there are nearly always gastrointestinal complications, such as distressing dyspepsia and diarrhea, with severe intestinal pain and straining. This form of tuberculosis rarely lasts longer than twelve months in young subjects. They generally die earlier, and not more than five or six months are necessary to a fatal issue in perhaps the majority of cases. In young subjects hemorrhage is hardly ever present, the chessy degeneration of Niemeyer marking the course of the case throughout.

PROGNOSIS.—The prognosis is almost always very bad. The disease is usually not recognized sufficiently early to avert fatal issue. Recovery may ensue if children of tuberculous parentage be kept under close watch, and prompt measures in the way of constitutional homeopathic treatment, and good nourishing food and proper climatic conditions, be availed of early; but it is so often the case that broncho-pneumonia attends upon this form of general tuberculosis and brings about a sudden termination of the case that the prognosis should always be guarded.

TREATMENT.—The treatment of the various manifestations of tuberculosis that have been described is, in a general way, practically the same. Of course the homeopathician will carefully individualize his case in so far as the uses of remedies are concerned, but at the same time the real basis of successful treatment is nourishment, fresh air and sunshine. It is a clinical fact that subjects of tuberculosis whether infants, youths, adults or dumb animals, succumb much more quickly under unsanitary conditions and in cold, damp climates. The study of the geography of consumption shows that those sections of country possessed of moderate elevation, extreme dryness of atmosphere, and freedom from large areas of cultivation-soil are the best sanitariums for persons physically predisposed or already suffering tuberculous conditions. New Mexico, Arizona, certain parts of Colorado and the hilly portions of southwestern Texas show the least rate of mortality from consumption of any portion of the United States. As recorded in the United States census New Mexico gives perhaps the best record and Arizona the second best. Texas follows closely, and when it is taken into consideration that it is possessed of such an enormous territory that it has a number of climates, those of some sections being wholly unsuited to pulmonary troubles, while that of one particular section is especially suited to their necessities, it is quite clear that the advantages shown by that section are the full equal if not even superior to New Mexico and Arizona. A personal experience of nearly twenty years in the vicinity of San Antonio, in southwestern Texas, has fully convinced the author that the grassy hills west and northwest of that city, possessed as they are of more temperate climate and less of elevation than New Mexico or Arizona, afford the best natural sanitarium in the United States. However, without differentiating between individual sections it is enough to say that children of phthisical parents, or those showing the least tendency to the development of any form of tuberculosis in early life, should be removed to that climate that gives them the greatest dryness and purity of atmosphere, the largest number of sunny days, the largest number of sunny hours in those sunny days, and the greatest freedom from marked variability of temperature between midday and midnight. Asheville, North Carolina, Thomasville, Georgia, numerous points in Florida, especially those on the west coast, and certain favored localities in southern California, as well as the localities previously named, are deserving of consideration. Essential features of climate to be thought of in this connection are sunshine, purity of atmosphere and equability. I am quite convinced that the high nerve tension, rapid heart action and quicker breathing incident to considerable elevation are not only not beneficial where lung involvement has already commenced, but, on the contrary, are often harmful. One of the advantages possessed by the southwestern

part of Texas is that any altitude that may be desired, from sea level to seven thousand feet, is attainable in a semi-tropical climate and in a section of country that must necessarily always be devoted to pastoral pursuits. With many nervous children the sedative climate of the gulf coast of Florida or southern Texas is best. Here will be found a combination of the advantages of warmth and salt air from the gulf stream. If it should be proven that the atmosphere is too humid, and that increased expectoration and increase of night sweats occur, it would be well to move the patient back into the interior, where the atmosphere is dryer and the evaporation more pronounced. An out-door life in a climate bearing the essentials named is the best possible prophylaxis against the development of phthisis pulmonalis, in subjects of all ages.

Next in importance to climate is food. The phthisis patient needs nourishment, and concentrated nourishment at that. His diet should be a diet of nitrogenized food, as best represented in beef-broths, eggs and milk; but it must be borne in mind that the danger of lighting up tuberculous disease, in a child possessed of transmission-soil, by systemic infection from tuberculosis in cattle is greater than is generally supposed, and this should be guarded against by sterilization of the milk in case that article of diet is relied upon. It is a safe proposition that milk that has not been previously sterilized should never be given to tuberculous children. Meat in some form seems to be very necessary for the proper sustaining of the strength, but the same objection obtains here. It is more difficult, in fact, to guard against infection through diseased meat than bad milk, since it is possible to know the cow from which the milk is obtained, whereas it is impossible to know anything about the cattle that are slaughtered. But danger can usually be averted by carefully selecting the meat that is offered for sale. It would be paradoxical to hope to obtain steaks or roasts that are fresh, nutritious and juicy, and plentifully supplied with fat, from an animal suffering from tuberculosis. Furthermore, it is better to feed young children upon well-cooked meats than upon rare meats. Intestinal parasites are often introduced in beef juice and the scrapings of raw meat. This danger can be avoided by using beef-peptonoids. In this preparation the meat has undergone its albuminoid digestion in the chemical laboratory, and where reliable preparations of this character are obtainable the child is saved the combustion due to stomachic digestion, the food is much more quickly taken into the system than when administered crude, and all danger of food infection is obviated.

The question of child-feeding in incipient tuberculosis is an all-important one, and will usually be found to be a very difficult problem to solve; and the advantages of out-door life are manifest just here again. Children who are playing out-of-doors in the

fresh air and sunshine are much more likely to be possessed of good appetites and healthy digestion than those who are housed in close quarters, and kept in climates in which out-door play is impossible for several months of the year. Besides milk and beef, which form the basis of food for the lung invalid, eggs, peas, beans, lentils, sweet potatoes and other nourishing vegetables should be freely supplied. They are fat-makers, rich in nitrogen, and if thoroughly well cooked are not difficult of digestion.

I have learned to interdict the use of stimulants in children. I do not know that I have ever seen good arising from their use in child-life in tuberculous diseases, and I feel sure that I have often witnessed elevation of temperature, increase of headache, greater degree of relaxation and consequent increase of night sweats, and other unpleasant symptoms follow upon their use. There may be some excuse for prescribing alcoholic liquors in that form of lung trouble belonging to adult life that develops through dyspepsia, with its general torpor, hypochondria, etc., because here the liver does not properly perform its glycogenic function, its physiological distillery does not manufacture the amount of alcohol necessary for the proper carbonification of food, and the introduction of alcohol from without in moderate quantity may, perhaps, be permissible; but in child-life it is not possible to too severely condemn the practice of prescribing liquors in any form.

Carbonifying foods are found in chemically pure cod liver oil and some of the petroleum emulsions at present on the market. I have discarded the grosser emulsions of the stock trade and for some years past have employed only Squibb's pure cod liver oil, or Phillips' digestible emulsion, where the oil diet has been resorted to. Squibb's preparation is as free from taste and odor as it is possible to render cod liver oil, and can usually be given to a child in its milk or without disguising menstruum. It is also the pleasantest preparation of cod liver oil for external use. Nightly oil bathings, especially over the chest, under the arms and in the groins and inner surfaces of the thighs, with brisk rubbing, are sometimes found to be beneficial where the oil cannot be retained by the stomach; and here again the odorless preparation is much more pleasant than the rancid commercial oils put up in bulk.

Without desiring to in the least appear to recommend individual proprietary foods it is but just to suggest that of the various emulsion preparations on the market, I have found nothing to equal the Angier petroleum emulsion. It is the best restorative with which I am acquainted. Children who rebel at cod liver oil are nearly always ready to compromise on this preparation. It is not unpleasant. The taste and the appetite improve quickly under its use. Greater and quicker gains in weight are made from this food than from any individual article of diet I have resorted to. It wears well after a few months, and should be used in alternation with

other dietetic preparations, not being continuously given more than two or three months at a time. If suited to the taste the appetite and strength will show prompt improvement, and it often starts an improvement in delicate children that natural foods or cod liver oil, or both combined, will continue. The chief thought in the diet of tuberculous children is nitrogenation. Foods that admit of ready combustion and give off the largest amount of bodily heat with the least amount of digestive effort are those that are demanded. There are many proprietary foods that might be mentioned in this connection, but it is so necessary to individualize in this as in all other particulars that much must be left to the judgment of the practitioner. In individual instances where albuminoid substances are not relished, buttermilk and koumyss will be found advantageous. In certain portions of Europe, in Switzerland especially, where "cures" are in existence and over-alimentation or forced feeding of milk in various forms is adopted, koumyss forms the basis of the diet. This milk-wine diet is very grateful to many subjects, and is especially adaptable in those cases of rapid phthisis characterized by high fever and quick combustion.

Medication.—The treatment of phthisis pulmonalis must necessarily be individual and symptomatic. In a general way the remedies which seem to compensate for tissue waste, or which so affect the digestive and assimilative functions that the best possible degree of nourishment of the human system shall result, should form the basis of medication. In recent years, since the bacillar theory of causation has become so generally adopted, efforts have been made to creosotize the mucous membranes and blood in the hope of destroying the bacillus and curing the disease by direct contact of this agent with the disease-processes. Creosote has been administered in crude form and by inhalation, but excepting in its proper homeopathic potency I have not found it advantageous when administered internally, though when given by inhalation it sometimes has a very salutary effect in that it purifies the breath and removes offensive odors. It seems also to decrease the quantity and improve the character of the expectoration, and general improvement in the local conditions is sometimes found to follow upon its use.

In a general way the deep-acting, constitutional homeopathic remedies, as *Calcarea*, *Ferrum*, *Sulphur*, *Arsenicum*, *Silica*, are most beneficial in the general treatment of the tuberculous processes.

In child-life *Calcarea*, either the *carbonica*, *jodata* or *phosphorica*, best meets the general constitutional state. The *Calcarea* subject is pale, anemic, flabby, the fontanelles are open, or are closed late in infancy; the child takes cold easily, sweats easily, especially about the head and neck, the pillow being often dampened with perspiration, and its system is non-resistant and

easily prostrated. It is especially applicable to pot-bellied infants with cold feet and hands, emaciated limbs, large, glassy eyes and of the strictly leuco-phlegmatic temperament. There is weakness of the digestive organs and an indisposition to food. *Calcareo phosphorica* will be more especially indicated when the emaciation is very marked and rapid, the sweat profuse about the head and neck, the expectoration greenish and purulent, and the case accompanied by headache and excessive languor. *Calcareo iodidum* is more applicable to young subjects who grow too rapidly and in whom there is a tickling, teasing cough, with rapid pulse, high temperature and commencing hepatization of the lungs. The cervical glands and perhaps other glands are enlarged and indurated; emaciation and hectic occur early, and the case tends toward rapid development of general glandular tuberculosis. The *iodide* relates especially to the glandular system and miliary tuberculosis; the *phosphoric* to meningeal complications and bony disease; the *carbonate* to general emaciation and involvement of the gastrointestinal tract.

Next to *Calcareo* as a general constitutional remedy for tuberculosis the various preparations of *Ferrum* are useful. The *acetate* is one of the best remedies for acute phthisis, more especially of youths. Hectic fever, night sweats and muscular debility come on quickly, emaciation is rapid and the breathing is easily affected, exertion of any kind being impossible because of a shortness of breath. *Ferrum phosphoricum* is a very useful remedy when fever is pronounced and the tendency to hemoptysis is marked. Blood spittings, nosebleed, debility, very flushed face, phthisis florida, with headache and great prostration, characterize *Ferrum phosphoricum*. This remedy and *Calcareo phosphorica* are equally adapted to cases of phthisis occurring at the age of puberty, especially in girls in whom menstruation fails to promptly appear.

Arsenicum is another deep acting remedy that corresponds to the tuberculous cachexia. Its effect upon the blood is very like that of the tuberculous process and its pathogenesis presents almost a counterpart of the hectic conditions present in phthisis; the rigors, fevers, sweats, diarrhoea, dyspeptic symptoms and general debility are so much like the picture of phthisis in young subjects as to make it at least very similar, if not the similitum in a great many cases. Its cough is worse in the evening and morning. It has sharp, darting pains in the lungs, worse from motion; it has the apprehensive anxiety of phthisis, and profuse greenish, fetid, salty expectoration. The anorexia of confirmed phthisis is not more pronounced than the disgust for food in the tuberculous states of very young children with moderate fever, glandular enlargement, distended abdomen, mesenteric involvement, asthmatic breathing and general debility, when the *iodide* of *Arsenicum* is indicated, its picture being a combination of that of *Arsenicum* and *Iodum*.

Phosphorus is spoken of by Grauvogl as the nearest to a specific remedy for phthisis. He recommends the sub-phosphates of soda and lime as being the best type of remedy of all the preparations of phosphorus in crude doses, for their effect upon tuberculous diathesis, even going so far to suggest that if softening has begun and has not made rapid progress the tubercles are absorbed and disappear. I have not employed phosphorus in these preparations, but have found the potentized remedy to be one of the very best. It is especially suitable to precocious children with large heads and active brains, whose necks are thin and scrawny, and whose throats are chicken-breasted. The skin is transparent and sallow; attacks of bronchitis are frequent, breathing is irregular and labored, and the debility is almost as pronounced as in the calcareous; short, quick panting breathing, with loss of strength and general relaxation of the system, especially of the rectum and bowels, call for *Phosphorus*.

Silicia is a basic remedy of great value. While especially recommended for the catarrhal form of phthisis in old people I have found it wonderfully helpful in children of two or three years of age, who early develop cough without rapid emaciation; the cough seems loose as though a good deal of expectoration were being formed, which, however, is not raised in children of tender age. The breath is offensive and if sputum is expectorated or vomited it is offensive and thin. The feet and legs sweat profusely; the skin is unhealthy, showing tuberculous deposits. Paronychia and styes, and tuberculous ulcerations here and there, characterize the *Silicia* case. In phthisis florida with abscess formation it will often retard the ulcerative process and assist in the healing process. I am satisfied I have witnessed restoration of health in young subjects a number of times under it where the phthisical habit was pronounced, and the physical symptoms and conditions were decidedly suspicious. In the caseous form it is especially applicable, and since that is the variety that affects young children most often, *Silicia* is frequently called for in the tuberculous conditions of infant life. It is a handmaid to the calcareous, and no matter what remedy may be indicated for individual symptoms, as diarrhea, dyspepsia, excessive cough, unusual fever, debility, sweats, etc., either *Silicia* or *Calcareous* will most often serve as the constitutional or basic remedy in children possessed of transmission-soil.

The *Silicia* child is withered, wasted, sallow and debilitated. It is harsh and dry, rather than moist and relaxed. Its feet and hands burn so that it doesn't care to keep them covered. The child is so hot that it pants for breath; oppression and distress characterize the *Silicia* patient. It is a remedy that should be used with caution, as repeated doses of a low potency sometimes light up the tubercular state in those phthisically predisposed, but in whom trouble has not yet developed.

Lycopodium has proven to be one of the best remedies in the materia medica in phthisis of children following upon measles or whooping-cough, especially in slender girls of sallow complexion and ill-developed neck and chest. It corresponds also to emaciation of the trunk and arms, and to the existence of atonic-dyspepsia, enormous distention of the abdomen, quick satiety from little food, rendering the nourishment of the infant or youth difficult. Its expectoration is greenish and purulent and there is a great deal of rattling of mucus in the chest. It meets bronchio-pneumonia in *Lycopodium* subjects, whose symptoms are all worse in the afternoon and evening, and in whom dyspepsia, torpor of the bowels, and emaciation of the chest and neck are pronounced.

Iodum, in the medium attenuations, is a noble remedy in the incipient phthisis of young adults and older children where the apices are early involved, the degree of hepatization being out of proportion to the general symptoms of tuberculosis. Consolidation goes on without a great amount of hectic or unusual emaciation. The emaciation is slow, the cough persistent and annoying, the temperature rather constantly elevated. In pot-bellied children with mesenteric and peritoneal tuberculosis it is often a useful remedy.

Other remedies that possess value in special cases and should be studied in connection with the phthisis of child-life are *Petræum*, *Phosphoric acid*, *Psorinum*, *Sanguinaria*, *Kali carbonicum*, *Drosera*, especially after whooping cough, *China*, *Hepar*, and *Calcarea fluorica* in phthisis florida.

Tuberculinum and *Bacillinum* are remedies that are being extolled by those who use the nosodes largely. Dr. J. Compton Burnett, England, claims to have had especially satisfactory results under the use of the former. I have not found them successful, although I have given them faithful trial to *Tuberculinum* in the sixtieth and one hundredth potencies. I have never used *Bacillinum*. I cannot believe that it is likely that this type of remedy will be attended by satisfactory results. It seems to me that it is not along the line of the homeopathic law of cure, and as yet isopathy has not been sufficiently proven to be considered altogether deserving of a place among the established theories of treatment. I have also used *Pyrogenum* without effect. It is recommended in the hectic of consumption, and while I have administered it repeatedly in phthisis florida I cannot say that I have been impressed with its efficacy.

CHAPTER VII.

RICKETS.

General Considerations—Pathology—Symptoms and Course—Diet and Hygiene—Treatment.

General Considerations.—Rickets is a disease of child-life that manifests itself chiefly by faulty nutrition of the osseous system. Its symptoms are not confined, however, to the bones, for rickety children are generally ill-developed, the nervous and muscular systems suffering equally with the skeleton. Besides the deformities shown in the long bones, which are especially subject to abnormal curvatures, resulting in knock-knee, bow-legs and ungainly arms, there is a degree of weakness of the muscles, especially the long muscles, amounting almost to paresis. The mal-nutrition is so general as to induce anatomical changes in the spleen, liver and kidneys in severe forms of the disease, and as to

render the blood anemic and non-nourishing, so that every organ and tissue fails in perfectness and the typical case of severe rickets becomes a general constitutional affection. The spine and thorax are so seriously involved in the process that spinal curvatures, even extreme deformities of the spine and chest, occur. Hunch-back, pigeon-breastedness, antero-postero- and lateral-curvatures of the spine and other deformities of the trunk are almost invariably due to rickets. It has long been held that rickets is an hereditary disease. Recent authors are holding, however, that it is hereditary only in the sense that tuberculosis and gout and rheumatism and choreic states are hereditary. From lack of proper nourishment in utero rickets may be developed in the fetus and children be born with the disease, or already deformed. Rickety fetuses are frequently still-born because of their ill-nourishment. (Fig. 15.) In such cases the limbs are usually short and greatly curved. In the line of hereditary influence it can be truly said that children of syphilitic and tubercular parents are more disposed to rickets, and also that the chil-



FIG. 15.
CONGENITAL
RACHITIS.

dren of parents who were rickety in infancy and early life are more likely to develop this disease. Rickety children are often born of anemic mothers, those who have suffered from lack of proper food

and have lived in unhygienic surroundings during the pregnant state. The children of maternal hard drinkers are more predisposed to the development of the disease, and, in fact, any constitutional condition of the maternal parent, that interferes with the proper nutrition of herself and fetus is likely to result in the bearing of a rickety infant, or of predisposition to rickets, the disease developing later.

One of the most common causes of rickets is improper nourishment during the earlier months or years of life. Children who are marasmatic, who have suffered severe gastro-intestinal complaints, who have been artificially fed from the first, or who have been retained too long on a milk diet, especially those who have been martyrs at the breast because of the supposed protective influence of prolonged nursing against subsequent impregnation, are the children most likely to develop this disease. Children who are born prematurely, and children who are brought up in unsanitary surroundings, amid dirt and filth, on impure and scanty food, or on food possessing an excessive amount of starch, are suitable subjects for rickets. Not only does too much starch in infant-food predispose to the disease, but an absence of fat and the too long continuance of the child upon food suited only to early infant life deprive it of sufficiently strong nourishment, and as a result the system suffers and rickets develops. The greatest number of typical cases are found in the hovels and slums, among the children of the poor whose food is not greatly varied nor of the best. Premature weaning is a common cause of the disease, the chemistry of the maternal nourishment more nearly meeting the demands of every portion of the infantile system than any other food. Not only does an excess of starch or an excess of sugar or a deficiency in fat and nitrogenous elements predispose children to rickets, but disturbance in the chemical balance of infant food so interferes with the evenness of development of the child as to render it more liable to the constitutional disorders of children. A great many explanations have been offered upon the basis of chemistry. It is often held that lactic acid in excess in the food induces rickets. Other authors attribute it to a deficiency of the lime salts. Others have supposed it to be due to a deficiency of hydrochloric acid in the gastric juice. Some have held that there is deficiency of phosphoric acid or phosphates, and that the absence of these elements prevents the proper formation of bone. None of these theories has received general acceptance at the hands of careful observers, all of whom seem to have settled down upon the hypothesis that rickets is a disease of disturbance in the proper distribution of the proximate principles of the human body, either to excess or deficiency, the bony system suffering most severely, but the muscular and nervous systems and also the glandular system feeling the impress.

Pathology.—The bones, especially the long bones, show the greatest changes. At the epiphyseal junctions there will be a zone of proliferation, which as the abnormality is developed is shown in the formation of a collar or ring (Fig. 16) thrown out at the point of union of the epiphysis with the shaft, giving to the ends of the long bones a bulged appearance. This new ossification is more spongy and vascular than healthy bone, and the periosteum strips off from it easily. The frontal and parietal bones sometimes show flat protuberances, which are tender, but as a rule the deformities are confined to the ends of the long bones. There is a deficiency in the bony-salts, and in consequence curving of the long bones occurs, developing knock-knee and bow-legs. The arch of the instep is not perfectly turned, and flat-foot, with its reflex symptoms and ugly gait, is developed. Sometimes the periosteum thickens and becomes infiltrated over the epiphyseal enlargements, resulting in a great deal of tenderness at those points, making walking painful, and interfering with the ordinary active movements of child-life. The muscular system suffers, and while rickety children are not necessarily emaciated, even though they sometimes are mere skeletons, yet there is almost always a flabbiness of muscle, lack of tonicity and consequent lack of muscular strength. The mucous membranes



FIG. 16.

are likely to suffer from catarrhal conditions, and, as a result, conjunctivitis, otorrhea, excessive salivation and nasal catarrh are common among rickety subjects. The spleen and liver sometimes enlarge to such a degree as to cause a great deal of distention of the upper part of the abdomen, and they are tender upon pressure. As in all anemic states the white blood corpuscles are in excess, and the function of the spleen is so increased that it is usually large and sensitive to pressure, especially in infants.

The belly of the rickety child is almost always protuberant, not so much from the enlargement of the liver and spleen as from the weakness of its muscular walls, and the consequent distention of the stomach and intestines with gases. It is also rendered more bulging and spherical because of the shortened spine and contracted thorax of the truly rickety child, those tending to bulge the abdomen forward and laterally. The brain is not especially apt to suffer in rickets. On the other hand, it has long been noted that children the subjects of this disease seem to be abnormally bright intellectually. The nervous system suffers, so that many are choreic. It can be readily understood that the lack of tonicity and vigor of the muscular system gives nervous manifestations greater prominence because of the lack of responsiveness on the

part of the muscles to the demands of the patient, rendering in-coordination more or less certain in pronounced cases. The most serious pathological changes belong to the bony system, and especially to the trunk. The short bones become softened and less resistant. In numerous cases the vertebrae and cartilages of the spine soften and curvatures result. These are nearly always antero-posterior, with slight lateral deflection, following the regular course of the spine. In extreme cases the curvature is sufficiently pronounced to cause serious impairment of the functions of the thoracic organs. Deformity of the thorax often results upon softening of the ribs. Instead of encircling the infant body to join at the sternum, as they should, they project from the spine almost directly outward laterally and then turn inward with an unusually short curve to form their sternal junction. The chicken-breast of rickets is a well-known deformity resulting from deficient supply of calcareous matter as the ribs and sternum are formed. Pelvic deformities are exceedingly important when they occur in female children, impressing unfavorably the parturient process in them as adults, often making obstetric operations necessary.

An important influence of rickets in infant life is the effect of the disease upon the teeth. They are usually very much delayed, the first teeth sometimes not appearing until the child is a year old or older. The order of their eruption is also interfered with, and both sets of teeth decay early, being deficient in enamel and so irregular and uneven that the upper and lower teeth do not adapt themselves to each other. Rickety children are apt to suffer from unbristly gums and thus lose their teeth early in life. The process undoubtedly has its influence upon the alveoli, and occasionally the permanent teeth are lost early, or are so ill-formed as to make their early extraction necessary, and thus the rickety subject is prematurely rendered toothless.

SYMPTOMS AND COURSE.—The early symptoms of rickets are not easily recognized. Other than the late closing of the fontanelles, the tendency to perspiration about the head, and the proneness to gastric and intestinal disturbances, there is nothing to call attention to the on-coming of rickets until the long bones begin to show tenderness at their extremities, and then enlargement. Should the disease manifest itself as an acute ailment, so sometimes happens, there will be slight fever, difficult dentition, pain upon being fondled or jostled in the arms of the nurse, and sometimes headache, as shown by continued frowning and contractions of the brows, and even convulsions, without a sufficient degree of abnormality in the teething process to account for spasms on this score. The very late appearance of the teeth and their early decay, together with inability on the part of the child to support itself in a sitting posture, or to exercise its muscular system as healthy infants do, together with marked distention of the abdomen,

flabbiness of the limbs and nodulations in the ribs, may be the first symptoms to suggest themselves. Rickety children are late in standing or walking. If the disease process is set up early there will be unusual prominence of the frontal and parietal bosses, and the occipital bone may be flattened from the child's lying upon it, it not being as resistant as it should be, being deficient in lime-substance. The fontanelles and sutures are late in closing, and when closed are rough and more prominent than they should be. The long bones of the legs curve early from efforts at standing, and chicken-breastedness begins to show itself from the lateral flattening of the ribs. The nodulations that show at the junction of the ribs with the cartilage go to form what is called the rickety rosary, this being one of the first symptoms observed, occurring in early infancy and disappearing after four or five years of age. The head of the rickets child is unusually large in proportion to its neck, and it may be ill-shaped. From lack of muscular tone the jaw is apt to hang, the lower jaw being elongated and the superior maxilla being correspondingly flattened over the antrum. Changes throughout the entire bony system show themselves as the disease progresses. The clavicle is usually very prominent at its sternal end, and the scapula is more flattened than it should be. The lower end of the radius and ulna are swollen, the tibia is more or less bent, the appearance of knock-knee shows itself early, as the child begins to walk, and the general anemic and debilitated appearance of the infant, who has become very much shriveled and very ungainly in form, will usually make the diagnosis easy. As the disease progresses as an acute ailment the nervous system suffers and convulsions are not at all uncommon from slight cause, as from the irritation of teething, the pain of indigestion, from fright, anger and other emotions. The nerve centers seem to be in an unstable condition, probably from lack of proper nutrition, and in consequence the infant is irritable, vehement, hysterical.

The deformities of rickets have already been touched upon in a general way, but will be treated of further in the surgical department of this volume.

Diet and Hygiene.—In families in which rickets is known to prevail or to have already occurred, careful attention should be given to the nourishment and hygiene of the mother during the pregnant state. Her food should be of the most nutritious varieties and as free as possible from starch and liberally supplied with calcareous elements. Meat in all forms, shell fish, especially oysters, and vegetables known to be nutritious and yet free of lactose, should make up the body of her diet. The fruits rich in grape-sugar should be used, rather than vegetables containing cane-sugar. A vigorous out-of-door life should be practiced throughout the pregnancy, and as a helpful measure the exhibition of constitutional

remedies, as the calcareas, will unquestionably impress the mother favorably and have their influence upon the fetus. I am quite convinced that in all constitutional states, as rickets, tuberculosis, syphilis and rheumatism, pre-natal treatment will go far toward modifying these diseases in infant life. The infant born with rickets should receive attention from the moment of birth. If the mother is enjoying reasonably good health she may nurse the baby, but if she is a rickety subject or a sufferer from any of the constitutional dyscrasias it will be better to put the child upon the breast of a healthy wet nurse. If it be impossible to secure the proper nurse it will be better to undertake to bring up the baby on cow's milk or the milk of other animals than to subject it to the artificial foods, especially those rich in starch. The best proprietary baby food for children pre-disposed to rickets in the earlier months of infancy is Mellin's Food, in which the lactose has been changed to maltose. Bovine, Murock's liquid food and Valentine's beef juice are permissible later. The farinaceous foods that are rich in starch should be tabooed. As the digestive organs are able to take care of it, pure cod liver oil may be administered in half tea-spoonful doses. The child may also be bathed in olive oil or cod liver oil in early life. An excellent beef preparation, when the digestive organs are very weak, is beef-peptonoids in which the albuminoids have been converted into peptones by artificial digestion. Rickety children are especially subject to gastric disturbances, because of the debility of the gastric juices and the feediness of their ferments. Hence, if milk is to be relied upon it should be peptonized. It goes without saying that no matter in what form it is given it should be pasteurized. The Meigs' milk prescription, the basis of which is cream, affords a very satisfactory food for rickety children.

It should be borne in mind that in children two or three years old who develop acute rickets there is often an association of a scorbutic condition, in which event the fruit juices, those of orange, lemon and grape fruit, and also the pulp of ripe grapes, are often very beneficial. Green vegetables are permissible if the child be old enough to digest them, but in younger subjects they are forbidden. Sea-bathing is often very beneficial, and a change from an interior climate to the sea shore, especially during the hot months of the year, is a measure the importance of which cannot be well over-estimated. Out-of-door life should be practiced just as much as possible, the only caution necessary arising from the fact that rickety children are often predisposed to bronchial affections, and sudden changes of temperature are to be avoided. But this should not be construed into a suggestion that rachitic infants should be kept warmly housed all the time. Fresh air, nourishing food, good hygienic surroundings, are of the utmost importance in the treatment of this disease.

Treatment.—Old school authors recommend *Phosphorus* as the remedy of all remedies for the rickety state. It is given in 1-120 of a grain, dissolved in olive oil and repeated two or three times a day. In this treatment there is a border-line practice of homoeopathy. For ages the treatment of rachitis has been directed along the line of the administration of lime and other phosphates, but more recently it has been learned by clinical experience that the administration of pure phosphorus in an emulsion of oil has been attended by the most successful results in its empiric treatment. This is not to be wondered at when it is remembered that *Phosphorus* in its action upon the blood and bony systems, as shown in its pathogenesis, creates a condition very closely related in its physical manifestations to rachitis. *Phosphorus* subjects have exostoses of the skull, which are painful to the touch and worse at night. Their fibre is relaxed, muscular system flabby, the lack of contractile power marked; this is especially characteristic as it relates to the rectum. The sympathetic system suffers under *Phosphorus*; the breathing is short and panting, the intestines are relaxed so that diarrhea occurs, the gastric secretions are debilitated, and digestion is correspondingly interfered with. The blood is anemic in the *Phosphorus* state, and syncope occurs upon slight exertion. Lateral curvatures of the spine are sometimes benefited where the entire picture is that of *Phosphorus*, as it so often is in rickety children.

Calcareo carbonica is more especially useful during the teething period. The fontanelles are late in closing, and the teeth are cut late and with difficulty. Curvature of the spine and deformities of the extremities begin to show during the teething period, and these grow into the characteristic rachitic deformity of the child. The *Calcareo* child is relaxed, but is not as dry as the *Phosphorus* subject. It sweats easily, especially about the forehead and neck. *Calcareo* suits the pot-bellied child, whose abdomen is distended more because of muscular relaxation than from gaseous distension.

Calcareo phosphorica is perhaps the best single remedy for the rachitic state. In it are represented both lime and phosphorus. The nutrition of the infant is defective; it is thin, emaciated and predisposed to glandular and osseous suppurations. Its abdomen is sunken rather than distended, as with the *carbonica*. The head is large and the fontanelles remain open late, even later than in the *Calcareo carbonica* child. The head is so large in proportion to the neck that it is supported with difficulty. The teeth develop tardily and decay early. The epiphyses are involved in inflammation and the joints are large and sore. *Calcareo phosphorica* is an excellent constitutional remedy for the hydrocephaloid state of rachitic children.

Fluoric acid is another excellent remedy. It is especially valuable where there is a combination of the syphilitic and rachitic dyscrasia; the long bones suffer periostitis and osteitis. The constitution is weakly and the complexion sallow; the muscles are softened and flabby and the feet and hands constantly bathed in perspiration. To differentiate, *Phosphorus* meets the general muscular flabbiness, spinal curvature and rickety relaxation; *Calcareo carbonica* is rather better suited to the teething period and the pot-bellied infant; *Calcareo phosphorica* is the basic remedy for the rachitic constitution, meeting this state better than *Phosphorus* or the carbonate of lime, while *Fluoric acid* is more useful than either of the preceding remedies when there is an engrafting of syphilis upon rickets or of rickets upon syphilis.

Silicia is very like *Calcareo carbonica*. The fontanelles are open, the abdomen is swollen and hot, there is profuse sweat about the head; but the *Silicia* sweat is *sour*, and with perspiration of the head the body of the infant is dry. The abdomen is more apt to be sunken, as with *Calcareo phosphorica*, than distended. Boils, abscesses, onychia and glands that threaten to suppurate, or that but partially suppurate and then indurate, are covered by *Silicia*.

Baryta carbonica is characterized by mental as well as physical dwarfing. The glands, especially those of the neck and throat, the tonsils particularly, are large and indurated; there are scurfy exudations on the heads and ears, the eyes are inflamed, the chronic sore eye of rachitic children, and there is general emaciation, though the appetite is good even to voraciousness.

Calcareo fluviat presents a combination of the symptoms, or a cross between the symptoms, of *Calcareo* and *Fluoric acid*. It has enlargement and swellings of the parietal bones of infants, deficient enamel of the teeth, unusual hardness of the cervical glands, and nodulations of the bones with suppuration long continued.

Mercerium is sometimes useful in the bony diseases of rachitic children presenting indications of a combination with syphilis.

Phosphoric acid often meets the state of debility and exhaustion even better than *Phosphorus*. The child grows too rapidly; has a pale, sickly look and mental development in excess of the physical. *Sulphur*, *Lycopodium*, *Kali phosphoricum*, *Kali hydratum* may also be studied to advantage. *Asafetida* is pronounced one of the best remedies for softened enlargements and curvatures of bone in bloated, clumsy children, with skin-ulcers and dark, raw-looking, unhealthy sores. The nervous sensibilities are so exhausted in rachitic sufferers that the child dreads to be bathed or even to be dressed.

Arseuium, especially the *iodide*, may be called for in glandular conditions and unhealthy states of the softened tissues of rickety infants. As a constitutional tonic, when the debility is marked,

it is especially useful. It is also indicated when a scorbutic state accompanies. The gums are softened and unhealthy, bleed easily, and there is a fetid odor from the mouth and gums. The digestive organs suffer in proportion, and debility and diarrhoea, offensive in character, attend upon the scorbutic state.

Kreosotum should not be forgotten where the teeth show early decay in the rachitic child, especially the temporary set, which show dark spots and begin to crumble almost as soon as they appear. *Staphisagria* also has crumbling of the teeth, which are black and carious; the gums are swollen and ulcerate and bleed easily. *Kreosotum* has greater cadaverousness of the mouth than *Staphisagria*, and its diarrhoea is exceedingly penetrating and cadaverous. Rachitic girls, even of tender age, show offensive, irritating leucorrhoea.

Nitric acid, *Carbo vegetabilis*, *China*, *Mercurius*, and *Muriatic acid* will also be called for in individual cases.

The various preparations of iron, especially *Ferrum phosphoratum*, will also be found useful in special cases.

CHAPTER VIII.

SCURVY.

General Considerations—Diagnosis—Dietetics—Treatment.

General Considerations.—Scurvy has long been recognized as a disease especially common to sailors and people whose occupations are such as to deprive them of the advantages of a vegetable and fruit diet; but there occurs in infancy exactly the same state. It is seen most frequently in the first eighteen months of life and is doubtless due to the same causes that produce it in adult life, that is, faulty nourishment, or to the long continuance of a strictly animal or more often a strictly farinaceous diet. It is characterized by anemic debility, flabbiness, especially of the lower limbs, and swollen, tender, spongy, bleeding gums. The teeth loosen and are lost early. If the individual case is characterized by easy bleeding of the gums there is also likely to be hemorrhage from the nose, and occasionally from the kidneys and bowels. In unusually severe cases, where constitutional disturbances are pronounced, purpuric spots occur over the body from slight bruises and even from long continued lying in one position. There is such a close resemblance between the symptoms of scurvy and rickets, in so far as their general constitutional phases are concerned, that they have long been treated of synonymously; and it has been held that scurvy is but the mouth manifestation of the rickety disease. There are essential points of difference, however, between the two.

and their proper treatment demands careful differentiation. There is no doubt that rickety children are more apt to suffer from scorbatis than children of robust constitution. In addition to the rickety diathesis it is necessary for the development of scurvy that there should be continued absence from the child's food of elements supplied only by fruits and fresh food. While it is recognized that scurvy exists more generally among the lower classes, and for this reason it has been held that it is more apt to be due to the rickety constitution, it is now quite well understood that its existence among poor people depends more upon faultiness in their diet than upon constitutional dyscrasia. But scurvy is seen among the better classes of people, and more often since the bottle-fed baby has become the fad. Children nursed at the breast for the proper period and then put upon the mixed diet belonging rightfully to all children at the end of the first year of life are not at all predisposed to scurvy; but the children of well-to-do parents who are continued over-long on strictly milk diet, or, and more likely, those who are fed for months or a year or two in succession upon farinaceous proprietary foods, either with or without milk, are the subjects of this disease. It is not a common disorder, but when met with it is important that it should be recognized, because its sensible treatment will depend largely upon a proper dietary.

Symptoms and Course.—The scurvy child is weak and anemic to commence with. Scorbatis, as recognized by its mouth symptoms chiefly, is not seen in perfectly robust children. The anemic child is irritable and fretful, and its little muscles are tender, so that it manifests pain on being handled. Its limbs are also sensitive to touch, and unless the physician is careful he may mistake the scorbutic tenderness and swelling for rheumatism. The thigh is more commonly the seat of the swelling, which is fusiform in character, from hemorrhage beneath the periosteum and about the shaft of the femur. This is the most characteristic pathological lesion of the disease and is due undoubtedly to the altered condition of the blood. The hemorrhage seems to be confined generally to the legs; the epiphyses are detached and hemorrhage from the bone vessels persists until they are completely separated and lie in loose black clots of blood in fatal cases. These hemorrhages occur about the tibia and fibula also, but are not shown to belong to other than the long bones of the legs. In severe cases hemorrhages occur from the kidneys and bladder, and the blood is dark and fluid. The spleen is enlarged and tender, and softened in fatal cases, and structural changes are found to exist in all of the organs of the body. Following upon the fretfulness and pavidness of the scurvy infant is its indisposition to be moved and painedness to cry upon being handled; the mouth becomes hot and swollen, and the gums bleed and swell from the teeth. They are softened, swollen and tender, and bleed upon the slightest touch.

Sometimes the hemorrhage from the gums is constant and debilitating. Ulceration of the gums occurs, with a great deal of fetor and salivation, the secretion often being tinged with blood. Owing to the soreness of the mouth the child is unable to nurse or to partake of food readily, and if its constitutional condition is profound it may have to be fed over by rectal alimentation. As the disease progresses the fever is more marked, although slow. The skin is dry and shriveled and the child emaciates; it presents an ugly picture of marasmus, with its scorbutic mouth and swollen, scorbutic thighs and legs.

Diagnosis.—The diagnosis will depend upon the combination of symptoms of pain, tenderness and swelling of the lower limbs, with the scurvy mouth. The swelling of the thighs is cylindrical and non-fluctuating. The skin over the thighs is not hot, but is sometimes edematous. The limbs are exquisitely sensitive to the touch, especially at the ends of the long bones, but not in the joints. The pain of rheumatism is in the joints rather than in the leg, where the tenderness of rickets is located; nor is it attended by the cylindrical swelling of scurvy nor by the oral symptoms. The diagnosis can often be confirmed by the course of the case following the exhibition of anti-scorbutic diet. If the leg lesions are severe the improvement as it relates to them will be limited and very slow, but a rapid general improvement will determine a diagnosis of scurvy.

Dietetics.—Without understanding exactly why, it is an understood fact that the administration of the juices of oranges, lemons and grape-fruit are usually promptly followed by improvement in all the symptoms. Improvement may be equally prompt when the diet is changed from the strictly farinaceous diet to one of milk and beef broth. The scurvy child is not usually able to masticate solid foods, and, therefore, the ordinary vegetable diet is not available. But the juices of fruits are readily administered, and when meat is selected it should be given in pulp only or as meat juice. If the disease comes on during prolonged maternal lactation a generally mixed diet should be at once resorted to. If cow's milk has been the steady food it should be suspended and a diet of meat, vegetables and fruits be insisted upon. In mild cases but little more is necessary than the change of diet suggested. If severe debility and profound anemia exist climatic change, to the seashore or mountains, may serve as a useful tonic and assist in bringing about more prompt and complete recovery.

Treatment.—Remedies which will be found useful in the treatment of scorbutus are the profound blood remedies, as *Arsenicum*, *Corba vegetabilis*, *Mercurius*, *Phosphorus*, *Nitric acid* and *Kreosotum*.

Arsenicum is called for if the debility is pronounced, the condition in every sense being exceedingly profound. The child is

wan and emaciated, the gastro-intestinal disturbances are severe, and the smell from its mouth is excessively fetid. The feet and limbs are swollen and stiff and very painful, especially in the middle of the night.

Sulphur is needed when with bleeding gums and fetid breath there is the old, shriveled, wizened look of this remedy, with an unhealthy state of the skin. Not only are the gums bleeding and swollen but they are excessively tender, and with the discharge of blood there is also a discharge of fetid pus from about the roots of the teeth.

Mercurius will be needed when the gums recede from the teeth and are blue and unhealthy in color, with the mucous membranes of the cheeks also unhealthy. The legs are swollen and very painful. If, with the conditions just described, there are unhealthy, bluish ulcerations of the skin *Mercurius* will be more than ever needed.

Kreosotum is especially valuable for the mouth symptoms. The mouth is putrid and cadaverous; the gums are ulcerated, and epistaxis and discharges from the genitalia are present. The intense putridity and cadaverousness of the mouth call for the local administration of *Kreosotum*, by inhalation or very dilute solution.

Carbo vegetabilis is more especially indicated when the hemorrhage is persistent both from the gums and nose, and when the constitutional state is so profound that hemorrhages occur also from the kidneys and bowels. *Arsenicum* is very like *Kreosotum* in the fetor oris. *Lachesis* also meets this condition, especially when there is profound disorganization of the blood, as is common to the low putrid fevers. For the pains in the legs *Nitric acid*, *Mercurius*, *Syphytum* and *Arnica* will be found useful.

Cornu, *Kali phosphoricum* and *Phosphoric acid* may be needed for the complication of debility and putridity. Other remedies may be found useful in individual cases, but so much of success in the treatment of scurvy depends upon the immediate and proper change of diet that not often will extended medication be required.

Mouth washes, which may be sometimes needed because of the exceedingly unhealthy condition of the gums, and which may serve an excellent purpose in fetid cases, are *Calendula*, *Carbolic acid* and *Potassiumate of Potash*. One part of *Sacrus calendula* to ten of distilled water, used every two or three hours, promotes healing and removes fetor. *Carbolic acid*, in strength of one to two hundred, has also been found a very useful remedy, and *Kali permanganatus* in very weak solution is much preferred by some. It is not believed the local application of remedies of this kind, the mouth being immediately rinsed with pure water, will interfere with the action of the proper internal remedy, and the local condition is certainly very much improved by their use in severe cases.

CHAPTER IX.

ANGINA LUDOVICI.

General Considerations—Symptoms and Course—Treatment.

General Considerations.—Deep cervical cellulitis is the most serious manifestation of the old fashioned "scrofulous" affections. It is, fortunately, a very rare disease, but is occasionally seen among tuberculous subjects. The trouble begins as an inflammation of the cellular tissue surrounding the deep glands of the neck, and is attended, in severe cases, by profound prostration, general constitutional exhaustion, and extensive suppurative-inflammation involving more or less the whole neck. Sloughing of the cellular tissue very often occurs, and even the cheeks may suffer perforations from an upward extension of the ulcerative process. In ill-nourished, tuberculous children, those in whom the disease most often presents, considerable mortality ensues, usually from exhaustion, because of the severe drain upon the vitality from the extensive cellular inflammation and suppuration.

Symptoms and Course.—Commencing as apparently a simple redness or inflammation of the skin in the cervical region, there soon grows to be an infiltration into the cervical cellular tissue, causing doughiness and edema in this region. The sub-maxillary glands seem to be the starting point, and they are sometimes swollen and tender as the initial symptoms, the pain and redness of the skin just described, appear. In severe cases the swelling is great, involving the whole region of the floor of the mouth and the neck. Compression of the blood vessels of the neck may occur from the extension of the swelling, resulting in cerebral manifestations. Breathing may be materially interfered with from the same cause. In some instances the inflammation is confined to one side of the neck, which will be hard, tense and brownish-red. The swelling may reach down to the clavicle, and abscesses may form at the lower border of the neck, even penetrating the chest cavity. Empyema ensues from this cause, and metastatic pneumonia may also complicate the case. More often, however, the pathological lesion is confined to the cervical tissue and sub-maxillary glands. Deep incisions will be made necessary because of the infiltration and eventual suppuration which present. Constitutional symptoms of sepsis, as chills, sweats, diarrhea, jaundice and metastatic abscesses here and there, may follow upon severe or neglected cases. The disease is undoubtedly due to systemic infection from the development of specific bacilli or chemical toxins from sub-maxillary inflammation. Its cause may be introduced

from without the system, or may have developed because of the general ill-health of the child and its constitutional dyscrasie.

Treatment.—Besides the treatment indicated by incisions, and these should be free enough to admit of ready drainage of all infiltrated serum and pus which may be present, this form of angina will require constitutional support in the way of nourishing diet and nitrogenous artificial foods, especially cod liver oil, together with the administration of the homœopathic remedy applicable to cellulitis elsewhere, according to individual symptoms. In the first stages *Aconite*, *Belladonna* and *Apis*, especially *Apis*, are likely to be found useful. As suppuration sets in or threatens *Hepar*, *Mercurius* and *Silica* may be called for, depending upon the constitutional symptoms and pus formation; *Mercurius* if it be desired to promote suppuration, *Hepar* if suppuration has already set in and it be desired to hasten it and terminate it quickly, and *Silica* if it be thought best to retard the formation of pus, or to prevent its further formation if it has already appeared.

Arsenicum, *Lachesis*, *Crotalus* or *Carbo vegetabilis* will be indicated should gangrene threaten or the constitutional condition become very profound. *Sulphur* and *Calcarea* will often be found suitable as basic remedies.

CHAPTER X.

ANEMIA.

General Considerations.—Simple Anemia—Pernicious Anemia—Splenie Anemia—Bulgkies' Disease—Leukemia—Treatment—Diet and Hygiene.

General Considerations.—Anemia belongs to all ages of life. Infants suffer from it as well as adults, and it often presents itself in young children without appreciable specific cause. It is most often associated, however, with profound constitutional diseases such as tuberculosis, syphilis and rickets. Anemic states follow upon many acute disorders, especially the gastro-intestinal troubles of young children, but anemia occurring idiopathically, or without pre-existence of acute inflammatory blood-altering disease, is difficult to understand. The composition of blood in infant life shows that during the first two weeks it is more venous in appearance than later. The red corpuscles vary greatly in size, being both larger and smaller than in adult life. Their number is proportionately larger. On the other hand a fact of importance in connection with anemia is that the lymphocytes or colorless blood-cells are much greater in number in young infants than in adults. The specific gravity is higher immediately after birth, also, and the amount of hemoglobin is greater in infancy.

Anemia is due to a decrease in the amount of hemoglobin, or the corpuscular elements of the blood, and is more often a symptom of some disturbance in the vital economy than a disease *per se*. It follows upon the various conditions of disease as a secondary state, and may be due to primary lesions of either the blood-making or the blood-destroying organs.

Various anemic classifications are made, as simple anemia or chlorosis, progressive pernicious anemia, anemia belonging to the spleen and its disorders, called splenic anemia, anemia involving chiefly the lymphatic system, termed Hodgkins' disease, and leukemia, or diseases of the blood-making organs.

Simple Anemia.—When anemia presents as a primary affection it is manifested by an exceeding paleness or waxiness of the child's skin. Some babies are perfectly well, apparently, and yet anemic. The author has under his care at this time a child who is very waxy in appearance, its ears being almost transparent and its skin as free from blood as it is possible for an infant's skin to be, yet it enjoys good health, is plump and apparently well nourished, and manifests no indications of ill-health. Such children are usually very pallid and generally non-resistant and lacking in vigor; their appetites are precocious and voracious; their stools are generally very light in color, and despite the anemia the intellect is usually bright. It is said that in most cases of anemia there is enlargement and tenderness of the spleen, but I have seen numbers of cases in which this organ did not seem to be in the least disturbed. If the spleen is involved there is a little increase in temperature in the evening, the thermometer showing a rise of a degree and a half or two degrees. Such children are fretful, their appetites are notional, their bowels are either constipated or tend to laxness, and the subjects are otherwise not well. Where the spleen is not involved the condition more nearly resembles chlorosis, and debility rather than peevishness and ill-health characterizes the case. Such children are usually short of breath and hemie murmurs are discoverable. Cases of this character occurring about the age of puberty manifest voracious appetite, sometimes to that degree that most unusual articles will be desired, some of which are not even included in the ordinary list of edibles. If the subject be a girl there is apt to be absence of menstruation, positive hemie murmurs, headache, despondency, catarrhal leucorrhœa, and if engrafted upon tuberculosis acute phthisis may develop at this time. It is not uncommon to witness the development of pronounced anemic states in boys at the age of puberty, but it is more common to the opposite sex at that time. Occurring in early infancy it shows no favoritism as to sex.

Pernicious Anemia.—Pernicious anemia is an extreme presentation of cases bearing the characteristics belonging to simple anemia in greatly exaggerated degree. The first symptoms showing

in an anemic child, for pernicious anemia does not develop in children who are enjoying good health, are weakness, shortness of breath and pallor, coming on without apparent active cause. The skin, which has before been pale, grows whiter and finally earthy in color. The mucous membranes, especially those of the mouth, are pale and bluish. The veins show on the transparent skin as blue, but empty or partially so. Nausea and vomiting, because of debility of the gastric secretions, are common symptoms, and excessive nose bleed of pale serum occurs. In special cases purpuric spots are seen on the skin. The weakness and pallor increase gradually, sometimes quickly; edema of the extremities occurs, and nightly rises of temperature with morning normal or sub-normal range are seen in pronounced cases. Headache is a common symptom, and, as is to be expected, malaise and general languor are pronounced. Soft bemic murmurs are heard at the apex of the heart and the venous murmur at the neck. The pulse is soft and compressible, the temperature is rarely very much increased, the condition being one of impoverishment or debility of the blood, as characterized by fatty degeneration and bloodlessness of the various organs of the body. It is simple anemia intensified. The outlook is grave, and unless checked by proper constitutional treatment and supporting diet pernicious anemia cases are likely to result fatally in from three to six months.

Splenic Anemia.—Splenic anemia is not materially different is so far as the external appearance of the child is concerned from simple anemia, but it is attended by enlargement of the spleen. In some cases it is greatly enlarged, in others moderately so. The symptoms are those belonging to the forms already described with the addition of tenderness and enlargement of the spleen, with the annoyance incident to its pressure upward against the lung or against the stomach, and with the additional symptom that it is more likely to be attended by irregular paroxysms of fever somewhat simulating malarial states. The liver is occasionally involved in the splenic form of anemia, being enlarged and tender and torpid. Catarrhal inflammation of the bronchial tubes occurs and occasionally gastro-intestinal disorders accompany the splenic disturbance.

The enlargement of the spleen in this form of anemia is to be diagnosed from the ordinary ague cake of chronic malarial infection and from organic diseases of the left kidney. There should be little if any trouble in this respect, nor is it likely that the enlargement of the spleen belonging to typhoid fever or other acute diseases will be confounded with its enlargement from splenic anemia.

Hodgkins' Disease.—Lymphatic anemia is characterized by enlargement of various groups of lymphatic glands, the cervical, axillary and mediastinal being first affected. The glands in the

sterno-mastoid region or the group at the angle of the jaw may be the first to show enlargement. The inguinal glands become involved as the disease progresses, and the liver, lungs, kidneys and other glandular structures are infiltrated in the course of its progress. The spleen is always involved, generally very much enlarged and indurated, and the cervical glands may completely encircle the neck and present such a degree of enlargement and induration as to press upon the blood vessels and trachea, interfering with the circulation of blood in the brain and causing dyspnea. An intermittent form of fever will attend these crises, and sometimes the diagnosis in the early stage is quite difficult. The skin shows more of a bronzing than any of the other forms of anemia, and late in life, but not in children, cancerous development may occur in one or more of the glands affected. Lymphatic anemia presents vertigo, headache, lassitude and sometimes obstinate diarrhea. The skin is usually very pale and when the general anemia is pronounced and the glandular enlargement about the neck well advanced there will be little difficulty in giving to the disease its name, anemia lymphatica. It is most common in children from five to ten years of age, although it comes earlier, and is among the more fatal glandular ailments, its course lasting over a period of from one to five years.

Leukemia.—Leucocythemia, as this condition is also called, is characterized by a reduction in both the red and white corpuscles of the blood with all the general symptoms of anemia. The spleen is always enlarged, sometimes enormously so. (See Fig. 17.) The lymphatic glands are enlarged also, the increase in size depending upon general hyperplasia. The lymphatic glands of the neck, axilla and groins may enlarge to the size of a pullet egg or larger, and the spleen may extend as far over and downward as the umbilicus or even further. Its peculiar pathological condition is that the marrow of the long bones increases in size in young subjects where ossification is not yet advanced. It may even so distend the bones as to cause their rupture.

The earliest symptoms to which attention is likely to be called is abdominal distention due to the enlargement of the spleen; and because of its mechanical interference with the action of the stomach and intestines, and also because of the debility of the gastric and intestinal juices due to the altered state of the blood, dyspeptic symptoms present early, such as anorexia, capricious appetite, nausea, flatulence and diarrhea. Pressure of the enlarged spleen upon the blood vessels, together with the debility of the vascular system that ensues from general impoverishment, early results in edema of the extremities. Muscular wasting occurs, and with the exception of its enormously swollen abdomen and its dropsical feet the leucocythemic child grows very much emaciated as the disease progresses. Leukemia develops

especially after chronic malarial infection, syphilis, tuberculosis or rickets as do nearly all these glandular affections. The skin and

mucous membranes are pallid, the patient is short of breath, he fatigues easily and suffers from palpitation of the heart and smothering. Fever of moderate severity characterizes the course of the case, and takes on a remittent or intermittent character, and, coupled with the enlargement of the spleen, may confound the disease with intermittent malarial fever. It is differentiated from malarial fever by the lack of periodicity, the greater and more rapid general enlargement of the spleen, and the occasional involvement of the lymphatic glands, which are not enlarged in malarial states. The prognosis of this affection is always grave and it generally results fatally usually within a few months. Sometimes in adult life cases will drag along for three or four years. It is more fatal among adults than among children who under proper constitutional treatment and hygienic conditions occasionally recover.



FIG. 17.

SPLenic LEUKEMIA, COOK COUNTY HOSPITAL CASE.

Treatment.—The treatment of anemia, no matter what its variety, must be largely along the line of direct application of remedies to the glandular system and blood.

Arsenicum, and the various preparations of iron, cinchona and phosphorus are the basic medicines which will have to be relied upon as the constitutional helps, while various other remedies may be called for to meet special complications and severe symptoms presenting during the course of the disease.

Arsenicum more clearly reflects the anemic picture in its pathogenesis than perhaps any other single remedy. It has the pallor, debility, shortness of breath, weak heart action, profound blood changes, glandular enlargements, and general dyspeptic symp-

toms that accompany the various forms of anemia. It also causes intermittent febrile reaction, and thus presents as a similar remedy which may also be the similitum to individual cases. Its characteristic restlessness, its aggravations in the early afternoon and after midnight, its nervous apprehension and anxiety, its edema of extremities and general debility will indicate it in special cases.

China is useful when the periodicity of febrile reaction is more pronounced; the spleen is enlarged and tender, and the case partakes of chilliness, fever and sweat with clock-like regularity. The child is fretful and cross; the bowels are easily disturbed; the skin is hot and dry, and nose-bleed of pale or bright blood occurs frequently.

Ferrum, especially the *phosphoricum*, is applicable for hemorrhage occurring in connection with anemia, and meets those cases that are characterized by oppression of the chest, hemic murmurs of the neck, heart souffle, general debility and constipation.

Phosphorus.—The patient is very much relaxed and debilitated. Palpitation of the heart and shortness of breath, especially upon the least exertion, are very pronounced. Annoying diarrhea of loose, offensive stools, with complete relaxation or exhaustion following, calls for *Phosphorus*.

Calcarea carbonica and *Calcarea phosphorica* are especially indicated when the lymphatic glands are the seat of the disorder, especially the cervical glands of young children and of rapidly-growing young subjects. Exhaustive sweats, constant perspiration of the hands and feet, headache, and osseous complications will call for the *calcarea*.

Ferrum phosphoricum, *Sepia*, *Pulsatilla* and *Cyclamen* will be needed in the chlorosis of young girls with delayed menstruation, or menstruation of pale blood too long continued, causing debility and developing hemic murmurs. *Ferrum* has disgust for animal food, palpitation and blowing murmurs of the blood vessels. It is more especially indicated for diminution of the red blood corpuscles, and consequent anemia, than for anemia depending upon constitutional dyscrasia. *Pulsatilla* is especially beneficial in chlorotic subjects not benefited by quinine and the various preparations of iron, and especially when these remedies have been used to excess. There is an absence of menstruation either from amenorrhea or suppression, with despondency, debility, and general weakness of the digestive organs, so that the dyspeptic symptoms are marked. Other remedies that may be called for in special cases are *Graphites*, *Lycopodium*, *Kali carbonicum*, *Platina* and *Antimonium cratum*. *China*, *Arsenicum* and *Lachenis* are more likely to be needed in the splenic form of the disease, and *Conium Americanum* will often be found helpful in reducing the splenic enlargement.

Diet and Hygiene.—The diet of anemic patients should be highly nourishing. In children above five or six years of age, and especially in youths, the use of red wine in connection with nourishing food is often found beneficial. The glycogenic function of the liver is frequently impaired and the introduction of a moderate quantity of alcohol from without assists in the carbonification of the food and the better nourishing of the blood. Various meat juices, milk in cases with which it agrees, and occasionally cod liver oil will be found helpful. Especially in Hodgkins' disease will the oil be found to benefit. *Iodine* as represented in it or administered in homeopathic attenuation is often beneficial in this particular form of anemia. Sea bathing, fresh air, moderate altitude and reasonable exercise should all be availed of if the best results are to be hoped for.

CHAPTER XI.

PURPURA HEMORRHAGICA.

General Considerations—Simple Purpura—Purpura with Other Diseases—Pernicious Purpura—Symptoms and Pathology—Prognosis—Treatment.

General Considerations.—Among the diseases which are accounted blood disorders purpura hemorrhagica is prominent. It is characterized by hemorrhage from the mucous membranes and sometimes into the serous membranes and joints, and also beneath the skin. Simple purpura is an exudation from the capillaries and occurs in a variety of diseases; as in the purpuric type of small pox and measles, the malignant pernicious intermittent fever of the purpuric variety that occurs in the south and southwest, in scorbutus, pernicious anemia, and sometimes in connection with Hodgkins' disease, and also in cerebro-spinal meningitis, under the domestic name of spotted fever. The simple variety is not in itself malignant, but it implies a severe manifestation of the disease in which it occurs; and yet even here there are differences in degree. Purpuric erythema occurring in connection with measles or small pox are not nearly so severe as the hemorrhagic form, that is manifested by oozing through the pustules in small pox and from the mucous membrane in rubella. Purpura hemorrhagica is a name applied to the more severe forms of the disorder, characterized by disintegration of the blood and continued hemorrhages. Instead of purpuric spots in the integument there may be considerable areas of hemorrhage beneath it. Hemorrhage occurs also in and about the joints. In scurvy there are often hemorrhagic effusions, and in pernicious anemia these may occur to such degree as to cause distention of the bones in children from hemorrhages into the marrow. In pernicious intermittent fever hemorrhage may occur from the

mouth, nose, intestines and lungs, and hemorrhagic effusions take place also in almost any of the larger organs of the body. I have known of fatal cases of epistaxis in connection with profound malarial infection, and have in my own practice experienced more than one desperate case that necessitated the employment of every measure at hand in order to avert a fatal issue. Purpura is caused sometimes by the excessive use of iodide of potash, and it is now conceded that hemorrhagic varieties of intermittent fever, chronic in character, are frequently the result of the excessive use of quinine. Malaria hæmaturia is almost invariably aggravated from the administration of quinine, and is frequently promptly cured by the administration of constitutional antidotes to this drug. Purpuric spots are seen in connection with malarial hæmaturia, although oftentimes the hemorrhage from the kidneys is the only evidence of the disorganizing effect of quinine upon the blood. Varying degrees of echymosis occur in connection with individual cases of rheumatism, and purpuric spots are often seen under the skin about the joints. Where this condition obtains there is very apt to be effusion in and about the joints, and occasionally hemorrhages are seen from the mucous membranes. It is not attendant upon idiopathic rheumatism, nor is the heart usually involved in this spurious rheumatism, or rheumatica peliosis. It is necessary to differentiate purpura from the condition known as hæmophilia, which seems to be an hereditary tendency, if such a thing be possible, to hemorrhage. Children so predisposed are frequent sufferers from nose bleed; slight wounds bleed to exhaustion. Especially is this tendency frequent in cases predisposed to anemia as a symptom following upon almost any acute disease; the slightest bruises discolor the skin; extravasations in the cellular tissues beneath the eyes are common to whooping cough in these subjects; effusions occur about the joints and in the pleural cavity upon the inflammation of these organs, from cold or spurious rheumatism and from pleurisy. These effusions may be serous or hemorrhagic. Simple purpura is not a serious ailment. It is not accompanied as a rule by severe or general constitutional disturbances, but is rather attendant upon an impoverished state of the system from faulty food, bad hygienic surroundings, etc. It occurs more often among syphilitic children and those who are rachitic, and is also more likely to be seen in young subjects when the system is still debilitated from a severe attack of one of the eruptive fevers, especially scarlet fever. Young girls approaching the age of puberty are often the subject of purpuric spots about the lower extremities and thighs, and if they are not ordinarily robust and vigorous hemorrhages may occur from different parts of the body, especially the nose; the intestines and kidneys are also apt to suffer. Cases may be classified as purpuric in which the first appearances of menstruation are excessive and accompanied by purpuric spots over the body,

or by *rheumatica peliosis*, previously described. Pain and swelling of the joints, especially of the hands and feet, occur, and there may be effusion about the fibro-serous tissues. In severe cases internal hemorrhages occur, and not uncommon is a scorbutic state of the gums, with hemorrhage from the mucous membrane of the mouth, and considerable general debility and malaise. If the hemorrhages be severe, or if the constitutional condition shows a degree of prostration characteristic of the more pronounced type of the disease, prostration is a marked feature and the case will partake somewhat of the character of the ambulatory form of typhoid fever. Head ache, languor, anorexia and inability to exercise the brain or muscular system are present and at times the patient is compelled to take to her bed and remains feeble and helpless for even weeks at a time, occasional hemorrhages occurring from the nose, mouth, vagina and bowels, the tongue being dry and the lips and teeth covered with sordes; and at times there are present stupor and mild delirium. The case will be differentiated from typhoid fever by the absence of petechiae and intestinal symptoms.

Pronounced purpura hemorrhagica always shows a pulse of low tension, vertigo, with marked tendency to syncope, general anemia and nervous and physical languor. Dyspeptic symptoms are nearly always present, because of the debilitated condition of the gastric secretions, this rendering difficult the digestion of food. Recovery is always slow and tedious in confirmed cases because of the altered state of the blood, which shows rapid diminution of the red blood corpuscles and also of hemoglobin. Patients suffering from purpura hemorrhagica have unusual weakness of the vessel walls, especially the capillaries, due less to inflammation or the degeneration of disease than to an altered state of the blood that admits of its transmission through the vascular tissues. In large hemorrhages there may even be rupture of blood vessels due to degeneration of their walls and to thrombi. The capillaries are dilated and thus rupture. Little plugs resembling hyaline casts occupy them, and escape in connection with the hemorrhage. Bacteriological examinations reveal the presence of a long bacillus that is capable of cultivation in gelatin, and that if injected into guinea pigs or rabbits will develop purpuric spots in them. Besides the blood-changes and the softened condition of the capillaries and small vessels the spleen is usually enlarged, the liver enlarged and tender, and the various secretions of the body disturbed because of the abnormal state of the blood and the debility which follows. While with the various anemic states the spleen is more responsible, in purpura hemorrhagica the liver takes its part and is held to be the breeding place of the bacilli; Letzerich holding that the liver occupies the same relation to purpura that the spleen does to malarial fever.

Prognosis.—Simple purpura is a simple ailment. It depends upon a state of debility following other disorders, or anemic states dependent upon derangement of the vital organism. Purpura in itself in this case is not important except as indicative of a low state of vitality from other causes; and here it should prompt active measures toward the removal of the condition upon which it depends. Purpura fulminans, or purpura hemorrhagica proper, marked by large hemorrhages, or by continued bleeding, may exhaust the vitality to that degree that serious anemia ensues. The really grave cases are those in which anemia progresses until fatty degeneration of the heart, with or without dilatation of that organ, results, or in which visceral hemorrhages are profuse. The patient may bleed from the kidneys until life is endangered. I have more than once witnessed hemorrhage from the nose lasting over two or three days until the patient was so exhausted as to be scarcely able to breathe, these cases occurring with pernicious intermittent fever. The secondary kidney lesion dependent upon loss of blood from that organ, manifesting itself in the way of renal dropsy, is much more likely to prove fatal than the primary ailment.

Treatment.—The treatment of purpura will depend upon its cause and associations. Purpuric spots in connection with cerebro-spinal meningitis, depending wholly upon the inflammation of the meninges, will of course be met by proper treatment directed toward the primal disease. The same applies to the purpura fulminans of pernicious intermittent; likewise in relation to small pox and other diseases. Never occurring idiopathically the etiology of purpura must be ascertained and general constitutional treatment directed accordingly. Primarily, should the hemorrhage be marked, efforts should be directed toward checking it. This is sometimes very difficult. I recall one case, in which were prescribed not only the constitutional remedies belonging to homeopathic practice but local styptics and anti-hemorrhagics in crude form, that was only checked by packing the nostrils with the tannin powder of the oak puff-ball. Astringent sprays and astringent packing had already been tried. In the old school practice reliance is placed largely upon *Quinine*, *Gallie acid*, *Ergot* and turpentine; if the joints are involved in the condition described as rheumatica peliosis the salicylates, and later the coal tar derivatives are relied upon; and *Digitalis* is used chiefly where the heart has become affected from the loss of blood, with either exceedingly rapid or unusually slow heart action.

Before touching upon the homeopathic treatment of purpura it will be well to suggest that in violent manifestations of the disease, characterized by unusually severe or protracted hemorrhages, hot saline effusions or rectal effusions of hot salt water may be used. Several pints of hot solution may be administered per rec-

tum. Transfusion into the blood vessels is not considered with favor, because of the non-contractibility of the vessel and the danger of hemorrhage from the site of incision following upon the withdrawal of the tube; but this can be overcome by the application of compression forceps, and I should not hesitate to use and recommend saline transfusion in extreme cases. Where exhaustion threatens and syncope is present, because of excessive blood loss, it is well to elevate the foot of the bed and apply Esmarch's or other bandage to the lower extremities with gentle compression lasting for some hours at a time, in order to retain the blood within the trunk until the crisis is tided over. It goes without saying that purpuric patients need the best of sanitary surroundings and exceedingly nourishing diet. Wholesome liquid foods should be freely administered, and, if necessary, there should be added regular rectal alimentation, either bovine or Murdock's food being employed in connection with hot water and perhaps milk.

Arsenicum, *Ferrum phosphoricum*, *China*, *Sulphuric acid* and *Lachesis* have given the best results in the treatment of purpura.

Arsenicum will be called for when with the purpura there is unbearable internal heat, dyspnea, restlessness and anguish. The surface is cold, or cool, the internal body hot; purpuric spots occur about the chest, neck and abdomen. The old school recommends arsenic and iron in combination and relies largely upon Fowler's solution of arsenic. In this they are but practicing crude homeopathy. This remedy meets the anemic state, so commonly the cause of purpura, and the exhaustion and debility that depend upon its presence.

Ferrum is applicable where there is constant nose bleed of moderate severity, and hemoptysis; the patient's skin is transparent, waxy; constipation and headache are present; the blood is dark and the debility marked. The condition is not so profound as with *Arsenicum*, the hemorrhagic features being the ones calling for *Ferrum* rather than the profundity of constitutional manifestation. *Arsenicum* will very naturally be thought of in connection with chronic malarial infection, *Ferrum* with acute.

China.—With the hemorrhage there is exhaustion to that degree that profuse sweating occurs all over the body; marked periodicity of the symptoms, whether they be headache, feverishness, perspiration or bleedings; with the purpura the patient is jaundiced; soreness of the muscles and skin, with purpuric spots occurring upon parts lain upon.

Sulphuric acid is valuable in hemorrhage from the mouth and gums, vomiting of blood, purpuric spots over the forearm and legs; hemorrhage of black blood from all of the outlets of the body; exhaustion and tremor are present.

Lachesis meets hemorrhage from the nose and bowels, with extravasation over the body, and red and black streaks from

extravasated spots into surrounding tissues. Is exhibited in cerebro-spinal meningitis, with tenderness and gangrenous condition of ecchymosed areas; profound blood disorganization. Especially used in chronic intermittent fever where a great deal of quinine has been given, and in the hemorrhagic varieties of yellow fever, small pox and other severe diseases.

Scalé presents multiple hemorrhages and petechia, with hemorrhages of black blood into the pustules of small pox. Indicated in purpura hemorrhagica in young girls, especially when occurring near the age of puberty; prostration is profound, and hemorrhage is so attended by syncope as to make constant fanning necessary.

Phosphorus has hemorrhage from different organs of the body, petechia hemorrhagica in connection with various fevers, and is especially useful in hemoptysis and cardiac debility occurring with purpura; long continued bleeding from small wounds or small blood vessels; bleeding unto faintness.

Hamamelis, *Crotalus*, *Terrebinthina*, *Arnica*, *Trillium* and other remedies will be useful in special cases. *Terrebinthina* will be thought of, naturally, and is really one of the best remedies in malarial hematuria or hemorrhage from the kidney, no matter what its cause. *Erigeron* and *Trillium* are especially suited to hemorrhage from the genitalia occurring with pernicious intermittent fever, or with any manifestation of purpura. *Millefolium* will often check the bright hemorrhage from the nose or lungs attendant upon purpura fulminans. *Crotalus* is very like unto *Lachesis* in its symptomatology, the hemorrhages consisting of fluid, dark, non-coagulable blood that leaks through the vascular walls everywhere. *Nitric acid* may be occasionally called for, especially in purpura occurring with small pox or hemorrhage from the intestines.

CHAPTER XII.

SYPHILIS.

Hereditary Syphilis—Symptoms and Course—Mucous Membranes—Other Tissues—Nervous System—Osseal System—Acquired Syphilis—Diagnosis—Prognosis—Treatment—Nervous Disorders—Nourishment.

Hereditary Syphilis.—The new-born child may suffer from syphilis by hereditary transmission or by the acquirement of the disease in various ways. It may be transmitted by either parent at the moment of conception, either the spermatozoon or ovum being infected because of the existence of the disease in the parent. It is now well understood that transmission from the paternal side is easily possible if conception occur within a year from the existence of the disease as an acute ailment, unless the virus shall

have been actively antidoted by proper medication. The earlier after primary infection the seed is sown for a new being the greater its danger of being born diseased. Conversely, the remoter the period, especially if anti-syphilitic treatment has been employed, the less the danger of paternal transmission.

The same rule applies to the mother. If she has had syphilis recently her offspring will almost certainly be infected; but if two or three years shall have passed after the existence of syphilis in her person before she shall conceive the danger to her offspring is not very great. It has been held, and also denied, that the contraction of syphilis by the mother several months after conception does not endanger the child; but it is difficult to understand how it can be possible for a child-bearing woman to suffer from an acute manifestation of this disease, with its blood-saturation, and not transmit it to her offspring, which is at this time really a part of her anatomy. If the child shall have attained to the age of seven or eight months of uterine life its danger seems to be much less than in earlier months; that is, the manifestations of the disease will be much milder than if it is earlier infected. The child may also be infected at the time of birth from direct contact with the maternal tissues, if they are diseased.

A peculiar fact in connection with syphilis is that it is possible for the mother to become infected from the fetus by the development in it of syphilis from the paternal side of the house. So long as there is not a union of the spermatozoon and ovum the mother seems not to be endangered from the husband through the semen; but if the vital principle should unite with hers to start a new being, and that being develop syphilis while within her, it is possible that she may be affected and become a syphilitic from it.

If both father and mother have had syphilis within a few months or a year preceding conception a syphilitic infant is certain to result; and the more violent the disease-manifestations and the more recent the attack the more severely will the infant be affected. The liability of infantile infection seems to be greater from the paternal side of the house. A syphilitic infant may be begotten when the father is suffering any of the stages of the disease. The danger is greater in the primary stage, next greater in the secondary, and least of all in the tertiary.

One of the most frequent causes of abortion, and to my mind it is exceedingly fortunate that this is so, is syphilis. Early miscarriages, otherwise unaccountable, should always prompt inquiry in regard to the constitutional history of both father and mother. It is not my rule to try very hard to prevent miscarriage in syphilitic mothers, but upon the occurrence of this disaster it is proper that the physician immediately institute anti-syphilitic treatment in the suspected father, and also in the mother, since she has probably become infected by having conceived from him. By

continuing a course of proper constitutional treatment for a good period of time both may be put in good condition for a subsequent conception, and the mother may be able to carry her infant to maturity and give birth to a non-infected child.

The child infected in utero, or rather at time of conception, is quite likely to be less vigorous than the absolutely healthy child, and is more likely to perish at birth or from the various diseases of the new-born. If both parents are infected it is quite impossible for the child to be perfectly vigorous. It is always more or less atrophied, its circulation is weak, its skin shriveled and more or less cyanosed, and its muscular development is not complete. Although possessed of about the usual form it will be below normal in weight and vigor, and it is more likely to succumb to this debility, or to broncho-pneumonia or other disease of early infancy than the non-syphilitic escape. Many syphilitic infants are born with skin diseases, the most common perhaps being pemphigus. Ulcerative affections of the cornea may exist at birth, and gummata of the thymus gland, or of the heart or lungs or brain may be present. The mucous membrane may show superficial patches or ulceration, and the corners of the mouth are cracked. Or the child may not show any manifestations of the disease at the time of birth, these setting up with definite symptoms and course a month or so after birth, usually commencing in the second month. The earlier the disease manifests itself after birth the more severe it is likely to be.

Symptoms and Course.—The initial symptoms of hereditary syphilis, developed in the second or third month of child-life, are very like those of acute coryza. The child will be restless, feverish, and peevish. It does not care to nurse, and diarrhea or spitting of its food may accompany its first symptoms. Irritation of the nasal membrane follows promptly, and the child chafes while trying to nurse because of the stoppage of the nostrils by coryza, which irritates and excoriates the nose. The nasal secretion sometimes becomes thick and yellow and crusts about the nostrils, completely blocking their passage. Within two or three days after coryza sets in an erythematous rash appears about the forehead, genitals and thighs. It is quite red at first, but soon pales and shows as a dark, faded eruption of a copperish tinge. This eruption is papular, and from the starting points named may spread over the entire body. It develops rapidly, and is often profuse upon the palms of the hands and soles of the feet. Vesiculation occurs about the buttocks and thighs, and pustules may form over considerable areas, making the child very sore. Pemphigus is present in severe cases, and is one of the most characteristic of the syphilitic eruptions. These are most common on the palms, and on the soles, but they may be found elsewhere, as on the extremities, also on the trunk. The primary rash of infantile syphilis immediately following the

coryza and fever is a rose rash, very much like the disease called *roscola*. It fades in a few days, has very slight desquamation, and is invariably succeeded by the brownish or copperish tinge spoken of, thus rendering the diagnosis certain.

It is necessary to diagnose the syphilitic rash from other diseases, but usually there is little difficulty in this regard. The restlessness and coryza, followed by *roscola*, in turn succeeded by the copper-tinge, the rash appearing chiefly about the forehead and chest, and more especially on the genitals and palms and palmar surfaces of the feet, render it rather easy of recognition.

Mucous Membranes.—In addition to involvement of the nasal membrane the pharynx becomes red and swollen and the roof of the mouth shows mucous patches, sometimes in earliest infancy. The larynx is also invaded, and the cry of the syphilitic child besides being weak and whiny is usually coarse and harsh in its whininess. When mucous patches occur they will generally be found in the angles of the lips and buccal membranes, and on the sides and dorsum of the tongue. These mucous patches are whitish and their secretion is very infective. They frequently disappear under treatment in infancy only to return later, and so long as they recur it is evidence that further treatment is necessary. Occasionally the tonsils will be deeply ulcerated and the child's mouth be one mass of syphilitic sores, consisting of patches, fissures, and ulcers. In many instances infants thoroughly saturated with syphilis at birth develop anemia and wasting, and die within two or three weeks from exhaustion. They look wizened and scrawny, their color is muddy and their skin is shriveled, hanging in folds on the limbs, and tightly drawn over the face and forehead. Mal-nutrition is more often the cause of death than are the destructive syphilitic processes.

Other Tissues.—While the death-rate among syphilitic children is high, the disease being both the direct and indirect cause of many deaths, yet if the manifestations of the disease are not too severe at the time of birth, or immediately following, prompt constitutional treatment will often tide over the crisis and eventually the disease may be wholly cured. The old notion that syphilis is an incurable affection no longer holds true; but in order to be effective anti-syphilitic treatment must extend over a long period of time. Infant syphilitics are continually subjected to recurring manifestations of the disease, and should they be carried satisfactorily up to puberty it is quite likely that they will suffer from its deeper manifestations at this time. The periosteum is especially likely to suffer. Periostitis and caries of the long bones are of common occurrence. Ulceration, often to destruction of the soft palate, happens, and ulcerative and inflammatory diseases of the eye are not uncommon. The cervico-maxillary glands enlarge and become hard, and various nervous manifestations show themselves

at this time, if they have not done so before. Caries of the nasal bones may follow upon the severe coryza which characterizes the onset of the disease, and the inner nose and portions of the maxilla may be destroyed in the first few years of child-life. Syphilis of the epiphyses of the long bones occurs, especially at the lower ends, showing enlargement where they join to the shaft. (Figs. 18 and 19.) The teeth of the syphilitic child are delayed in their



FIG. 18.

eruption and are rarely perfect, usually undergoing early decay. The teeth of the second set come in irregularly and present characteristics which are diagnostic of the condition. They are not fully formed, lean more or less toward each other, not fitting very snugly in the maxilla, and are notched, presenting the saw-tooth appearance. The incisors especially show this notching, which is due to defective nutrition and belongs not alone to syphilis.



FIG. 19.

The teeth are not perfect in rickets but are not as regularly notched as in syphilis, and when this saw-tooth appearance is present in pronounced degree the suspicion of hereditary syphilis is justifiable.

Various diseased conditions of the eyes attend upon syphilis, most commonly about the age of puberty, among them iritis, inflammation of the choroid, and ulcerative inflammation of the cornea. Syphilitic keratitis is the most common of these affections and often destroys considerable areas of corneal tissues, even resulting in destruction of the balls.

Nervous System.—The brain and nervous system will often suffer severely from hereditary syphilis. Symptoms manifesting themselves in the brain tissue are gummata, fortunately quite rare in child-life, syphilomas at the base of the brain, thickening of the arteries, and chronic inflammation of the membranes and brain-tissue, resulting in infantile dementia or idiocy. Chronic hydrocephalus often depends upon brain syphilis; it is, however, a much more common attendant upon tubercular states. The nervous system suffers much more severely than the brain. Gower names syphilis as a frequent cause of disease of the spinal cord, charging it with the production of softening by compression of the cord by syphilitic growths, by injury to the cord and nerve roots, by syphilitic meningitis, and by the production of acute and chronic inflammation of the cord through syphilis. Locomotor ataxia is held to be often due to syphilis, as are also other degenerative diseases of the cord. I have under observation at this time a child of eleven years presenting syphilitic teeth, syphilitic rhagades, syphilitic choroiditis, progressive infantile dementia, general choreic manifestations and locomotor ataxia to

such degree that the gait is shambling, unsteady and pronouncedly ataxic, the origin of her disease being directly traceable to maternal syphilis.

Inveterate headache, worse at night, whether located in the pericranium or meninges, is a common complaint in hereditary syphilis.

Osteal System.—Besides suffering from the conditions described syphilitic children are sufferers from onychia, both of the ulcerative and nutritive varieties. Dactylitis, a typical case of

which is shown in Fig. 20, is also common. This consists of inflammation of the bone and periosteum, affecting especially the proximal phalanges and causing much suffering, resulting in considerable deformity of the fingers. Nodosities of various bones, especially the tibia, are common to syphilis along with these inflammations of the phalanges. In many cases in young children there is inflammation of the ends of the long bones and their cartilaginous attachments. These are especially common to the distal end of the femur and tibia.

When osteo-chondri-



FIG. 20.—Dactylitis.

tis is present there will be considerable deformity at the epiphyseal junction, and tenderness and soreness about the joints will occur to such degree that walking is rendered painful, with shambling gait, making it necessary to diagnose between this condition and oncoming ataxia.

Acquired Syphilis.—Infants are sometimes impregnated with syphilitic virus in earliest infancy by coming in contact with primary sores on the maternal genitals, or from a syphilitic nipple, and by becoming infected in other ways with syphilitic virus. Among syphilitic people direct inoculation is not uncommon and among the lower classes in larger cities the disease is often communicated to the infant by attendants and nurses who have syphilis. The poison may be brought in contact with the infant about the genitals or the mouth or eyes by carelessness on the part

of a syphilitic nurse in dressing her sores, not properly cleansing her fingers before handling the baby. The disease may also be communicated to the infant by being kissed by people who have syphilitic patches on their lips or in the mouth. It is not certain that it can be communicated to a healthy infant by the milk of a syphilitic wet-nurse; yet prudence will demand that extra care be exercised in selecting a wet-nurse that a non-syphilitic subject be employed.

The danger is not alone in the direction of the infant. Healthy wet-nurses may be infected by nursing an infant suffering from syphilis of the mouth, the virus being communicated through the saliva and being taken up by the glands of the nipple and breast, and then, in turn, such wet-nurse may communicate the disease to her own infant or to any other children she may be nursing. It should never be imposed upon a healthy wet-nurse to nurse a syphilitic infant.

Syphilis may be communicated to adults through attention to infants suffering the disease. Recently the author had a case in practice in which the aunt of a syphilitic child, a lovely young woman, contracted the disease by inoculating an abrasion on her finger with the secretion from a syphilitic sore on the infant's buttock, it not being known at the time that the sore was of syphilitic origin. She had a chancre on her finger, and went through a typical course of constitutional syphilis, even to periostitis and tibial nodes. The diagnosis was clearly proven by the curative effects of anti-syphilitic treatment and a course at Hot Springs.

The lungs, liver, spleen, kidney and other internal organs may suffer severe degenerative changes from constitutional syphilis. In fact, there is no organ or tissue of the human body not liable to its ravages.

Diagnosis.—It is not always easy to determine the presence of syphilis. In cases possessing, in pronounced degree, a considerable number of the symptoms which have been given, it will not be difficult. The rash may be mistaken for roscola, or the simple teething rash. Eruptions about the genitals are often caused by a failure to promptly change the napkins, this resulting in inflammation and excoriation of the integument. The coryza is not different at first from the coryza of the bad cold. Rickets has many of the bone symptoms of syphilis. The inflammation of the epiphyses in that disease is confined to the epiphyses, while in syphilis the enlargement occurs between the epiphyses and the shaft of the bone, forming a collar-like ring. (See Figs. 18 and 19.) The color of the lesion is important, none of the other eruptive disorders presenting the lean-ham, copper-colored tint of syphilis. No lesions simulate those of syphilis in the mouth, nor does rickets or tuberculosis cause nodes on the shafts of the long bones; nor do either of these diseases have the nightly aggrava-

tions of the bone-pains that belong to syphilis. The teeth with their notched appearance and awkwardly irregular shape are quite diagnostic, while the nervous irritation and fretfulness of the syphilitic child are quite unlike the whiny-sickliness of the rachitic child.

The diagnosis of syphilis is often cleared up by treatment. That there are certain medicinal agents that are well-nigh specific in this disease is beyond question, and the action of *Mercury*, and, the various preparations of *Potassium*, or *Nitric Acid*, *Thuya*, and it is said, of *Syphilinum*, will often make the diagnosis clear when it is impossible for the physician to successfully differentiate it.

Prognosis.—The prognosis of infantile syphilis is unfavorable if the child be born puny and with well-developed manifestations of the disease. Especially important in point of prognosis are the nasal symptoms. If the coryza be severe and the ulcerative process pronounced, destruction of the bone with extension of the disease into the frontal sinus and ethmoid develop acute meningeal symptoms, and early death results from this cause. The lungs become involved in pneumonia, and destructive ulcers of the larynx sometimes occur. General systemic poisoning overwhelms the infant in severe cases, the external manifestations of which are high fever and severe gastro-intestinal disturbances.

If the initial symptoms are milder the disturbances are more local in character and fatality will rarely ensue, but syphilitic manifestations are apt to crop out all through the infant's life, and even up to the age of puberty.

Treatment.—The treatment of syphilis should begin the moment conception by a syphilitic parent has been known to occur, and should be followed religiously by the administration to the mother of the proper medicaments throughout the entire pregnant period. It is not often, however, that it is possible for the physician to institute pre-natal treatment, and his first opportunity for prescribing is given when the coryza and febrile symptoms are manifested, unless, perchance, the infant be born with syphilitic eruption. When it is apparent that a child is suffering from syphilis active treatment should be immediately instituted, and persistently and faithfully kept up for a period of months, or even years.

Mercurius.—I have no sympathy with the dogmatic utterance of Tooker in his "Diseases of Children" in which he says: "There is but one remedy for syphilis, whether in child or adult, and when that fails hope may as well be abandoned," referring to mercury. As a matter of fact *Mercurius* is not often called for in the treatment of syphilis in the infant or young child. While distinctly the basic remedy for primary manifestations of the disease in adults, and even for many of the secondary processes, it is of but little value in congenital syphilis. If syphilis shall have been acquired from sores at the

maternal outlet, or if the infant shall have been infected by the virus of acute syphilis from its nurse, it may need *Mercurius* in some form. When this remedy is called for the symptoms will be those of ulcerative processes, accompanied by excessive swelling and inflammation. Whether ulceration be present as chancre or bubo it will be painful, and the edges of the ulcers be sharply defined; they will be covered at the bottom with ichorous pus. Phagedenic ulcers in the mouth, gums, and throat, and ulcers on the tongue, call especially for *Mercurius dulcis*. It is occasionally useful also for copper-colored eruptions appearing in spots over the body; but here, too, it is most useful in adult life. The nightly bone-pains will occasionally yield to the proper preparation of mercury, *Cosmabasis*, but, as already stated, this drug will rarely be called for in the infantile forms of the disease.

Kali bichromicum.—Commencing with the coryza I have had much better results from *Kali bichromicum*. It is especially helpful when the mucous membranes of the mouth, nose and throat are hyperemic and swollen. Perforating ulcers occur in the mouth or nose, and there is offensive and destructive ozena, with thick yellow nasal discharge.

Kali iodatum has an excoriating coryza, blistering the nostrils and lips, and it also has throbbing and burning in the nasal and frontal bones. It has gnawing, boring bone-pains and a papular eruption on the scalp and back.

Iodide of Potassium, in the thirtieth potency, in the infantile coryza of syphilis, is also useful and it meets the scaly syphilides better than any other remedy.

Fluoric acid has proven beneficial in syphilitic ulcerations of the mouth, throat and nose, where the discharges are thick and exceedingly acrid. The patient is fretful and peevish. It is one of the best remedies in the materia medica for syphilis in infants, and for young children who complain of pains in the legs and arms. It is also applicable to caries and necrosis, especially of the nasal bones and tibia.

Kreosotum is another remedy that is very beneficial in the acute coryza of syphilis, and where the disease-process affects the teeth, causing them to blacken and decay early. The mouth and throat are sore, and the corners of the mouth are ulcerated and cracked.

Nitric acid is a remedy of first importance in the nightly sufferings of the syphilitic child. And just here it should be borne in mind that in many cases children who are restless at night are the subjects of syphilitic pains. If their unhappiness cannot be traced to any other cause it can often be diagnosed by the administration of *Nitric acid*, *Mercurius*, or other indicated anti-syphilitic remedy. The *Nitric acid* ulcer is not as deep and sharply defined as that of *Mercurius*; its destructive process has "tendency

to bleed superficially." In infantile labial ulcers, and figwarts about the anus, as also in the copper-color eruption over the chest, *Nitric acid* will often be a remedy par excellence.

Mercurius is found beneficial in the bone pains of syphilis, and in perostitis where the parts are so sensitive that the least touch causes pain. It is an excellent remedy where *Mercurius* has been given to excess, as is so often the case.

Thuja is a remedy of first importance in tubercular syphilides. Nodulations on the skin, condylomata, ulcers, syphilitic rhagades, exuding a moisture that excoriates and itches, are often permanently cured by *Thuja*.

Aurum metallicum is among the very best remedies for infantile syphilis. Caries of the nasal bones and inveterate ozena are more often cured by *Aurum* than by any single remedy. If the patient is worse at night, and there are sharp lacerations in the bones of the head, with boring pains in the mastoid, *Aurum* will be called for.

Borago is a remedy I have never used, but it has been highly recommended for the syphilitic infant whose case is characterized by hard glandular swellings.

Syphilis engraved upon the tuberculous subject is quite likely to need *Sulphur*, *Silica*, *Thuja*, *Arsenicum*, *Lycopodium* or *Hepar*. *Cinnabaris* is especially a valuable remedy where syphilis is engraved upon the syctic diathesis.

Mezothorium and *Syphilinum* have been highly recommended among those who use the nosodes and high potencies, as curative of many of the syctic states of infancy. I am not familiar with their use. The testimony of Prof. H. C. Allen is strictly in their value.

Lachesis is curative in syphilitic ozena and aphonia, as also in otitis and periostitis after the abuse of *Mercurius*.

Hepar will often be called for in glandular suppurations, and it is one of the best antidotes to hyper-mercurialization common to the old school and to pseudo-homeopaths.

While it is not the intention of the author to deal much with the question of potency it is proper to state that in treating syphilis in infant-life the moderate attenuations, from the sixth to the twelfth, have been used most frequently. In the skin manifestations which so often call for the various preparations of *Potassium*, *Natrum* and *Sulphur* the higher attenuations have been found more helpful. It is almost criminal to so mask the manifestations of infantile syphilis with mercury or potash in crude doses, or even in lower attenuations, that it is difficult to diagnose between the destructive processes belonging to the disease and those peculiar to these remedies. The potash eruption is so much like that of syphilis that it is often very difficult to diagnose between them, a fact that is well known. It is also well known that the

very homeopathicity of *Mercurius* to the ulcerative syphilitic process is that which justifies its use in this disease, and its continued administration in low potency in child-life is sure to result in confusion. I have salivated children with the third trituration of *Mercurius solubilis*, and have seen severe mercurialization in the practice of others from the second and third attenuations long continued. Syphilis requires protracted treatment and mercury can never be safely given long at a time. Hence it is not the best anti-syphilitic, especially in congenital syphilis. *Iodine*, in combination with *Mercurius*, *Potassium* or *Calcareum*, better meets the systemic conditions. It is well known that it is the iodine rather than the potash in iodide of potassium that is so beneficial in tertiary syphilis. The *Iodide of Calcareum*, the *Iodide of Arsenicum* and the *Iodide of Potassium* will much oftener be needed to clear up the skin, bone and glandular manifestations of infantile syphilis than the preparations of mercury.

Nervous Disorders.—A genuine *Acte noir* are the nervous manifestations belonging to syphilis. The choreas, the infantile dementias, the locomotor ataxias, the paralyses, resist treatment much more stubbornly than do the skin, mucous membrane and bone lesions. At least this has been my experience. Gummatae respond better to *Kali hydriodicum* and *Arsenicum iodatum* than to other remedies. *Gold* is also a useful remedy, and *Phosphide of zinc* serves well in incipient locomotor ataxia, shambling gait and nervous gyrations. Headache of syphilitic origin responds better to strict anti-syphilitic treatment than to symptomatic prescribing, except that the symptoms should guide, after all, in differentiating between anti-syphilitic medicines. *Kali phosphoricum* sometimes serves a good purpose when the nerve irritations have been long continued and degeneration is pronounced. If nervous disturbances have followed suppression of a syphilitic eruption from the use of mercurial ointment, or other external applications, *Sulphur* will bring these to the surface again in many instances and thus relieve the nervous system. For syphilis has its metastases, as well as other diseases.

If rheumatism combines with nerve degeneration to make life miserable and retard the growth and interfere with the development of the child, climatic change should be a part of the treatment, and the various medicinal hot springs, especially those of Arkansas, will be found beneficial. Furthermore, if strictly antiodotal treatments are being pursued, these can safely be prosecuted with activity and persistence if the alterative effects of natural hot spring waters are availed of during treatment.

Nourishment.—Syphilitic children need support. They need it badly. The disease is severely destructive, and unless the system can be fortified while treatment is being pursued the patient is liable to succumb. Nutritious diet, as milk, beef-broths, beef-

steak, if the child is above a year old, eggs, cod liver oil, petroleum emulsion and other easily carbonized foods and foods rich in nitrogen are demanded. Fresh air and sunshine should also be a part of the regimen, syphilis needing all the dietetic and hygienic helps known.

CHAPTER XIII.

ERYSIPELAS.

General Consideration—Symptoms and Cause—Complications—Prognosis—Treatment.

General Considerations.—Erysipelas is an acute inflammatory disease of the skin and mucous membrane, depending upon infection as a cause. It occurs endemically rather than epidemically, and especially in the spring of the year. It is not confined to child-life, but is sufficiently common among children to justify its consideration in this volume. It is contagious as well as infectious, and can be conveyed by a third person, as is shown in connection with its propagation in association with parturition. In child-life

it is more marked among the children of alcoholics and among children whose sanitary surroundings are unwholesome, who are subject to sores and abrasions, the disease arising almost invariably from the introduction of the streptococcus pyogenes, which is now generally recognized as its causative factor. Some bacteriologists have undertaken to isolate the streptococcus erysipelatis. Richhorst describes it as being of serpentine form, a bead or chain coccus, that thrives in all kinds of cultures, but this author and Zieg-



FIG. 21.

ler and Osler all agree that its essential characteristics are those of the streptococcus pyogenes. (Fig. 21.)

Erysipelas does not attack sound skin, but may be introduced upon even the slightest injury or upon recent scar tissue. The disease was formerly quite common in hospitals, and is yet in prisons and foundling asylums. In the latter institutions it will often prevail epidemically. This fact has led to confusion, it being held that it is not necessary for a child to show an abrasion in order to develop erysipelas; but it must be remembered that children are especially liable to slight injuries, not severe enough to be noticeable, but yet sufficient to admit of the introduction of the erysipelatoous cocci. It is not known that atmospheric conditions have much to do

with the development of erysipelas, except that it occurs more frequently in the spring. This was formerly explained on the ground that children are more liable at this season of the year to the various "blood-diseases;" and erysipelas, or St. Anthony's Fire, as it has been called, was presumed to be one of the typical blood-disorders. The disease spreads more generally by direct contact from child to child, bed to bed, or ward to ward in hospitals. Yet it will be noted that it may develop in different wards successively, and careful investigation will show that in every instance the child first infected in a new locality is the subject of some slight abrasion, even though it be a pen-scratch or fester. Each new case serves as a new focus for the disease, and thus it may spread quite extensively from one original case. Favorable conditions for its spread are unsanitary surroundings, defective plumbing, bad ventilation, unwholesome conditions of the blood, ill-nourishment and constitutional dyscrasias, either syphilitic, tubercular, or rachitic. It attacks all ages, and may be seen in the infant at the breast as in older children. A not infrequent site in nursing children is the umbilicus. Erysipelatous omphalitis follows upon infection at the site of the cord. It may become extensive in area, involving the entire abdomen and resulting fatally.

Erysipelas is commonly seen at the junction of the mucous membrane and skin, as about the mouth, nose, eyes and ears. It may occur wherever there is an abrasion, and once introduced becomes systemic and recurring. It is a noticeable fact that persons who have had erysipelas are subject to subsequent attacks of the disease, and often at the seat of a former attack, as though the integument and cellular tissues at that point never fully recover, or become possessed of latent infection.

Symptoms and Course.—The symptoms and course of erysipelas are not very different in childhood and adult life. It is generally ushered in by a chill or series of chills, with loss of appetite, nausea, headache and sometimes with delirium. The chill is quickly followed by fever, full, bounding pulse and increase of temperature, which rises rapidly to 102° , even to 105° F. Its acme is reached in from three to five days, it holding rather steadily at its high point for a day or two, falling quickly and rising again in a few days if the disease be not promptly held in check, or if new extensions of it occur. (Fig. 22.) The general symptoms of erysipelas are due to toxemia, from the development in the inflamed areas of a toxine, it having been shown that the streptococci are not to be found



in the blood, even during severe attacks.

The incubative period of erysipelas lasts from three to six days. The initial symptoms just described are attended by swelling, burning pains, heat and redness at the site of inflammation. The immediate vicinity of the nose is the favorite location of the fire, and in the neighborhood of the ear it occurs next most often. It does not follow that it shall present as an inflammation at the site of an abrasion through which the infection may have occurred, especially in infant life, and it is this fact that has led to much confusion in relation to its etiology. Another confusion arises from the fact that what appears to be idiopathic erysipelas often develops from a draught of cold air blowing directly upon the face or neck, when it is covered with perspiration, and that the disease is presumed to follow immediately upon bathing the heated face with very cold water; but it must be borne in mind that many cases of simple dermatitis arising from these causes are not specific erysipelas.

If the nose be the starting point of the disease it spreads quickly towards the lips, forehead, scalp and ears, but not downward over the chin. The germ is said to follow closely the rhombic mesh-work of the skin, and thus it misses the chin. If it commences at an inflamed breast it extends to the armpits and over the chest, but not over the zyphoid. It follows along the course of lymph vessels, and red or blue streakings may be seen extending out in various directions from the local site of the disease. If a hand or foot be erysipelatous the disease shows lines extending well up the limb, toward the axilla or groin, and lymphatic enlargement and soreness occur in these localities.

In color the erysipelas inflammation is bright red; it is slightly elevated above the surrounding tissues. As it progresses the color deepens in shade until it becomes very dark red, even to purplishness of hue. The color dispels by pressure, but quickly returns upon the withdrawal of the fingers. In individual instances the erysipelatous skin will vesicate and exude drops of sticky serum, very like that from the ivy dermatitis, but not so profuse. If the grade of inflammation be very high the color will be intensely red, the skin very hot and painful, the sensation being of an itching, burning, stinging character. If the face be the site of the disease the distortion is sometimes frightful and the entire face looks as though it had been burned. The eyes are swollen shut, the alae nasi are thickened and distorted, the ears swollen and stiff, and the lips so swollen and bulging that they can be opened with difficulty. With this degree of facial infection, especially in children, there will nearly always be delirium, even to convulsions. Moreover, convulsions occasionally usher in the attack in nervous children also.

The inflammation in cases of ordinary severity attains its height by the third day, and immediately the acme has been reached there will commence a subsidence of the redness and swelling. If there has been extension of the disease to other tissues by

the time the subsidence at the initial state is well marked the inflammatory process in new areas will have begun to develop, so that it is not infrequent that successive outbreaks of erysipelatous inflammation are witnessed.

By the end of the fifth day from the first development the skin will show furfuraceous desquamation and considerable areas will shed in bran-like flakes. If the cellular tissues beneath the skin have been involved in the process, and a good deal of infiltration has occurred, there may be desquamation of the superficial integument in larger flakes. If vesicles have characterized the attack, crusts of varying size will form and dry and scale off.

Complications.—While erysipelas ordinarily pursues an active course and subsides in a few days without serious inconvenience to the general health yet in infant life it is attended by complications that are sometimes quite serious. Pneumonia is not an infrequent complication. This may present the usual manifestations of pneumonia, as from any inflammatory process; and it sometimes happens that instead of developing upon the skin the erysipelatous poison attacks the lung structure and acute croupous pneumonia will develop and cause death in a very few days. If the chest be the site of the disease pleurisy often follows. The kidneys are likely to suffer if they have been previously affected by other infectious disease, as scarlet fever. Suppurative inflammation of the neck or tissue of the orbit, with extension of the erysipelatous process to the brain, occurs, resulting in meningitis, death sometimes following; a fatal issue may ensue from the same cause if the ear be the site of the disease. Effusions occurring in the pleura result in empyema, and endocarditis and pericarditis are occasional attendants. Fatal peritonitis very often follows upon erysipelatous ophthalmitis. Local gangrene may result from the more violent attacks of phlegmonous erysipelas.

Prognosis.—The prognosis is almost invariably bad when the umbilicus is the seat of infective inflammation. It is also bad if pneumonia or meningitis set in. It is influenced unfavorably by the presence of diphtheria or rickets, and is much more apt to result fatally in children of chronic alcoholic-debauchees. It is also unfavorably influenced by general debility, ill-nourishment and vicious surroundings. Death is caused in the meningeal forms by convulsions; in the pneumonic complications by acute pneumonia or general empyema; in the local types by gangrene, or by exhaustion, which sometimes follow upon general ambulation of the process.

Treatment.—Prophylaxis should be directed toward the prevention of the disease by care to every wound of the child, no matter how trivial. Fatality following ophthalmitis should be looked upon as almost criminal, since there is no justification whatever for the appearance of this disease. The slightest manifestation of irrita-

tion about the navel demands thorough antiseptics. All kinds of abrasions, even the simplest, occurring in the presence of erysipelas in an asylum or family should receive immediate attention and be rendered aseptic. The child suffering an attack of erysipelas should be isolated from his fellows and playmates, isolation to last throughout the whole course of the disease. The tenacity of the streptococci erysipelatis demands as thorough fumigation and cleansing of the sick room subsequent to the disease as should follow scarlet fever or diphtheria. It is said that Ferrero propagated erysipelas from streptococci lodged on dry silk thread fifty-two days before. Upon the commencement of the case all upholstery should be removed from the room, and upon its completion the bed, walls, floor, sills, in fact everything about the room, should receive immediate attention. The bedding should be subjected to steam heat or destroyed. The floor, walls, case-boards, etc., should be scrubbed with corrosive sublimate; the walls should be re-calclmined, breasted or re-papered. Careful attention should be given all the instruments used about the erysipelatos case, and all cloths and dressings should be burned. The physician in attendance upon a case of erysipelas, no matter how simple, must decline all obstetric calls and surgical work while in charge. It has been demonstrated beyond question that erysipelas is a very common cause of puerperal fever, and surgical erysipelas is often directly resultant from carelessness in this regard. Nor should nurses who have been recently in attendance upon a case of erysipelas be allowed to take charge of confinement cases or to have to do with surgical patients.

A great many local remedies have been used in connection with erysipelas, but if well selected homoeopathic remedies be administered promptly there will usually be little occasion for these. One of the most recent of topical applications that is being highly lauded is the application of strong alcohol directly to the inflamed area, it being contended that it not only destroys the specific micro-cocci of the disease but that it allays the inflammation and limits its spread. I can imagine it might be beneficial in simple dermatitis but would prefer not to use it in true erysipelas. Among local applications in domestic practice are cranberries, scraped-beets, weak solution of acetic acid, application of scraped-potato, scraped-apple and other similar substances. In old school practice it is quite the rule to apply iodine either directly to the inflamed area or immediately around it in the hope of preventing its spread. Ichthyol has recently been recommended highly and used with more or less success by those who favor the local applications. The ethereal solution of iodoform is also applied and, in fact, innumerable topical remedies have been recommended. It has been my practice, however, to get along without any of these, and trust wholly to the indicated constitutional remedy, and thus far I have had no occasion to deviate from this plan.

In the initial stage the remedies suited to inflammations generally are most applicable, *as Aconite, Apis, Belladonna, Ferrum phosphoricum, Rhus tox.* and *Artenicum*.

Aconite is applicable if the case is ushered in with a chill from sudden suppression of perspiration by sudden exposure to cold rain or cold, raw winds, the chill being quickly followed by rise in temperature and the characteristic *Aconite* restlessness, thirst, bright-red inflammation and other well-known symptoms.

Belladonna is especially suited to the smooth variety that looks very much like the eruption of scarlet fever. It is applicable to erysipelas of the face and head, the right side being most affected. It will always be thought of in association with delirium and other brain symptoms depending upon new development or sudden suppression of the eruption, especially in children, and when the case tends toward convulsions.

Apis.—This remedy is suited to intense swelling and puffiness of the face, about the eyelids more particularly, with biting, burning, stinging pains in the inflamed area. In color the inflammation is of a delicate pink, while in *Aconite* it is bright red, even scarlet, and in *Belladonna* tends more to purplishness of hue. The edema is a marked symptom in the *Apis* case, and it is especially applicable if with erysipelas of the face there is edema of the larynx and general involvement of the throat.

Rhus tox.—*Rhus* is particularly applicable to the vesicular type of inflammation where the eruption is slow in developing and the patient suffers severe pains of the muscles, tendons and joints. Erysipelas following upon repression of perspiration from the patient getting wet; with aching of the joints; erysipelatous inflammation seen especially about the joints or on the scalp. *Rhus* is especially useful in cases assuming an adynamic type, with low, muttering delirium and general typhoid symptoms.

Artenicum is very much like *Rhus* in this respect, and will often be found necessary in low types of erysipelatous inflammation. The *Artenicum* case migrates from one part of the face to another, or from one limb to another.

Lachesis.—*Lachesis* follows *Belladonna* well, when the patient's face is puffed and red and when the brain symptoms fail to yield to *Belladonna*. *Lachesis* is more especially suited to left-side cases that have subsequently travelled to the right side.

Veratrum viride is highly recommended by Hughes in the first stages of phlegmonous erysipelas, and is used by some physicians locally in glycerine, as well as internally.

Ferrum phosphoricum is recommended by those using the tissue remedies in place of *Aconite* or *Veratrum viride*. The inflammation is smooth, quite general and the symptoms not so intense as in the *Aconite* patient. *Ferrum phosphoricum* is applicable to cases that need *Rhus* later, while *Aconite* better suits cases that call

for *Apis* later. *Rhus* should never follow nor precede *Apis*, even though these remedies are used alternately by careless prescribers.

Sulphur.—*Sulphur* will be called for in cases that are protracted, that do not recover promptly, especially when seen in the *Sulphur* child. The eruption never fully develops as a typical case of erysipelas; it draws along in an unhealthy state. *Hepar* may also be needed in this connection, and if the case be unusually protracted and attended by suppuration, *Arsenicum*, *Silicis*, *Lachesis*, *Carbo vegetabilis* and *Cinchona* are to be thought of. If gangrenous symptoms supervene *Arsenicum*, *Lachesis*, *Scilla*, *Carbo vegetabilis*, *Crotalus* and *Purina* will have to be studied. Topical applications of *Carbo vegetabilis* are sometimes used, either the crude willow charcoal or a paste made of the first or second attenuation mixed with water or glycerine.

If delirium should be a permanent symptom or if anything unusual in the way of convulsions should be seen in connection with erysipelas or repelling of erysipelatous eruption, remedies like *Stramonium*, *Nux vomica*, *Ignatia*, *Hyoscyamus*, *Passiflora*, *Capeum* and *Zincum* will be found useful as called for.

Capsacm is especially to be considered in connection with sudden recession of the eruption followed by convulsions.

The application of poultices to erysipelatous inflammations is always harmful. Cold, wet dressings, changed frequently, have been recommended and extensively used; but it seems to me that it is better to treat these cases through the system than to hope for benefit from any local measures. I have never had a case of erysipelas result disastrously, nor have I seen a case drag out to unusual length of time if properly met by the indicated homeopathic remedy. I am quite convinced that local treatments are worse than useless in most cases, especially in children, and if any is to be used it should be an aqueous solution of the remedy used internally. *Cantharis* and *Urtica urens* are used as topical remedies in association with their internal use, and if the eruption be especially painful, and the child be irritated very much by it, either of these or *Acornum*, *Belladonna* or *Apis* in aqueous solution externally may perhaps be permissible while the same remedy is being given internally.

The diet of the erysipelatous child should be light yet nourishing during the height of the disease. If the case draws along protractedly the patient should be supported by a liberal, nourishing diet. It goes without saying that the sanitary surroundings and local hygiene should be of the best. The disease prevails more extensively in foul quarters and crowded tenement houses than among children who are better cared for, and, as often noted, is seen to prevail epidemically under these circumstances; hence the necessity for extra care that the sanitary condition of the patient be made as satisfactory as possible.

CHAPTER XIV.

RHEUMATISM.

General Considerations.—Symptoms and Course.—Complications.—Diagnosis.—Prognosis.—Treatment.

General Considerations.—Along with many other diseases rheumatism is not confined to child-life, yet it is seen very often in children, rarely during the first four or five years, but quite commonly from that time on, increasing in frequency as age advances until young adult life is reached. It is especially liable to manifest itself in infancy as a sequel to the acute disorders, especially those attended by septic conditions, as malignant scarlet fever, follicular tonsillitis, and occasionally diphtheria. It depends upon the non-elimination from the system of the debris resulting from tissue-waste. It is often excited by exposure to draughts of air, sudden exposure to inclement weather, and to low, damp, cold surroundings. It runs in families and its development in a child seems often to depend upon hereditary influences. It has no preference for sex. Its occurrence in children is generally mild, although it may be very violent following the eruptive disorders, especially scarlet fever, and by its emigration to the heart and brain may result fatally.

Symptoms and Course.—The symptoms of rheumatism in children are about the same as in adult life. About the first thing complained of is soreness and tenderness in the joints, and soreness of the muscles if the muscular variety prevail. The joint affection is not apt to be severe, and the swelling and redness are less than with adults. The joints most usually affected are the hands, fingers, hips, wrists and shoulders. Usually not more than one or two joints are affected in one illness, although migration from joint to joint, or from the joint to the heart, may occur as in adults. A very common mistake made in infant-life is to confuse rheumatism with coxalgia, and it should be remembered that children under six years of age are not likely to have rheumatism except as secondary to scarlet fever. Should it develop during infant-life it will be attended by high fever, considerable swelling of different joints, with pain and tenderness and generally a good deal of redness about the limbs and ligaments of the joints. The temperature is not as high as in acute rheumatism in older people. The inability of young children to express themselves makes it difficult to diagnose the pain of rheumatism when of moderate severity and pyrexia. General rheumatic fever will not be difficult, however, of recognition. The pain upon being moved, the signs of inflamma-

tion about the joints, and the swelling and tenderness in these localities, will differentiate it from other diseases.

Complications.—Heart complications are more common than with adults. Endocarditis is especially a frequent complication. It is manifested by increased restlessness, sharp, dry cough, palpitation of the heart, rapid breathing, acute pain, or at least a sense of uneasiness, in the cardiac region, and an increase in the temperature, which remains rather higher and more steady than when the joints are involved. The second mitral murmur is heard more distinctly than when normal at the apex, and occasionally in marked cases a gentle murmur will be detected. The pulse is more tense than natural, and its beats are more irregular. Precoedial anxiety excites mental apprehension and restlessness. Difficulty of breathing compels the child to sit up, and this dyspnea is increased by the nervous irritation resulting from the labored respiration. Pericarditis occurs quite often and will be differentiated from endocarditis by the presence of the friction sound, more pronounced when effusion has occurred. Sometimes the heart will be quite displaced because of the effusion, and in severe cases it becomes necessary to aspirate the liquid from the pericardium in order to overcome the cardiac anxiety and respiratory depression. I witnessed a case five years ago in which Prof. F. E. Doughty, of New York, incised the chest wall and pericardium, drawing off eight ounces of straw-colored fluid in a child eleven years of age who had suffered a violent attack of acute inflammatory rheumatism following upon scarlet fever. Pericarditis with liquid effusion is quite common in children.

Rheumatism and chorea are frequently intimately associated, or else precede and follow each other. Indeed, it is now held that chorea is almost invariably engraved upon a rheumatic base. Rheumatic children disposed to chorea are of the irritable, nervous, emotional kind, in whom chorea develops immediately after rheumatism, either with or without heart weakness as a complication.

Occasionally the development of the nervous affection occurs during the height of an attack of rheumatism or as improvement begins to manifest itself. In other cases the symptoms are early marked by the development of acute chorea.

Rheumatism in child-life is often attended by the development of eruptions on the skin, either erythematous or urticarious. Occasionally purpuric spots are seen, and sometimes papular eruptions show themselves during the height of the disease. These are presumed to be due to the acid condition of the blood present during acute rheumatism.

Infantile rheumatism occurs more often through sepsis than through any other cause. It is especially prone to follow tonsillitis and scarlet fever. Post-tonsillar rheumatism is much more

common than is generally supposed, and often the association and connection is apt to be lost, rheumatic cases occurring two or three weeks after an attack of tonsillitis being very likely to be attributed to other causes; whereas, most often they are of septic origin, the sepsis almost always developing in the tonsil crypts. When the disease follows scarlet fever it is very apt to find its origin at this same site. Rheumatism may also follow upon hepatitis.

Diagnosis.—The diagnosis of rheumatism is naturally much more difficult in children than in adults. There are more causes of joint disease in children than in adult life, and idiopathic rheumatism may be confused with coxalgia, the epiphyseal inflammation of rickets or syphilis, and septic synovitis following upon scarlet fever. The long bones in the vicinity of the joints are also the seat of severe pains that occur through hemorrhage into their marrow in scurvy. From the latter it will be differentiated by the general scorbutic condition of the child, as the cylindrical swelling of its thigh or thighs, and the spongy, bleeding condition of its gums. Furthermore, acute scurvy presents a higher temperature than does rheumatism. The syphilitic state in children will show not only upon the joints but by the teeth and the syphilides, especially the copper-colored eruption on the chest. The tubercular joint disease of child-life has its ante-natal tubercular habit, and scarlatinal synovitis is differentiated by the fact that it attacks single joints and considerable effusion quickly occurs; whereas, rheumatism is likely to attack different joints, especially the smaller ones, as of the fingers and wrists. Coxalgia traces to the tubercular diathesis. The deformity at the hip manifests itself early, and is not likely to be attended by the heart complications going with rheumatism.

Prognosis.—Children rarely die of rheumatism per se, but should endocarditis be severe vegetations may occur upon the mitral valves until insufficiency follows and the child eventually succumbs to heart complications. Should the meninges be attacked in acute rheumatism congestion of the brain and violent convulsions may induce a fatal issue. More often rheumatism is severe because of permanent impairment of the heart, leading to secondary development of organic heart disease. Infants are born with endocarditis, the result of rheumatism in the mother, and in after years of child-life or in early adult life the lesion may become sufficiently serious to give concern.

Treatment.—Unusual care should be exercised by the physician in treating acute rheumatism or post-scarlatinal or post-tonsillar rheumatism in children. The alkaline treatments and the heart depressing remedies so common to the old school practice are apt to affect the cardiac organ seriously, even disastrously. In a general way a milk diet is very appropriate to rheumatic children. Whether the lactic acid in the child is the cause of rheumatism

or the result, the digestion of milk develops lactic acid, and thus seems to have a salutary effect upon the rheumatic child. On the contrary, a meat diet tends to materially aggravate the symptoms, and it is believed that the over-use of meat in early life is often the cause of rheumatism.

The clothing of a child disposed to rheumatism should be warm. Flannel should be worn next the skin day and night. Avoidance of unnecessary exposure to inclement weather and draughts of cold, damp air is necessary. By preference upper sleeping rooms are better for rheumatic infants.

In the matter of medical treatment a few well selected remedies will generally meet the indications in ordinary cases.

Acute.—Should the attack come on as an acute manifestation, attended by fever, restlessness, pain, heat and swelling about the joints, *Acute* will be found very useful; but it is only beneficial in the beginning of the acute articular form of the disease. The pain is very severe, the restlessness intense, the fever very acute and the anguish pronounced. If *Acute* is needed it will give relief in a few hours; if it does not it is a waste of time to continue it.

Belladonna will not often be needed, but is occasionally useful where the inflammation about the joints is extensive and the color is deep red, almost erysipelatous in hue. Occasionally this remedy will be found indicated because of the suddenness and violence of the paroxysms of pain. Pain occurring paroxysmally with intensity will often be successfully met with *Belladonna*. It is not especially adapted to the removal of the rheumatic condition, but I have found it very beneficial in relieving the manifestations just described, especially if the joints affected are of the right side.

Calcium is better suited to the sub-acute variety that has taken deep hold upon the patient. It will not often be needed in the first stages. It is especially useful in rheumatism of the fibrous tissues and periosteum, as also for the ligaments of the joints. It is to be thought of when the heart appears affected, the sensation being as though it were squeezed in a vise.

Dalcamara is beneficial in pseudo-rheumatism, in the rheumatoid pains of the muscles and joints arising from the taking of cold during the prevalence of damp, raw weather.

Kali bichromicum has been found very beneficial in cases of rheumatism occurring in changeable weather; from sudden cold spells coming on after hot weather. Rheumatism affecting especially the smaller joints.

Kalmia latifolia is beneficial in severe rheumatic pains not attended by fever or inflammation. It is especially applicable in pericarditis and endocarditis, the pains about the heart being so sharp as to cause the patient to gasp for breath.

Ledum palustre is peculiarly characteristic of rheumatism commencing in the joints of the lower extremities and extending

upward, finally involving all the joints of the body, or at least the larger ones. I have observed this *Kali* upward extension a number of times, relieving it with this remedy.

Lithium carbonicum is suited to cases involving the valves of the heart. Palpitation and shocks about the heart. *Lithium* corrects cases with some swelling and tenderness about the joints, especially the small joints. Painfulness of the feet, especially the soles of the feet and small joints, with sensation of burning therein.

Mercurius will often give prompt relief to children who suffer from rheumatic pains at night, who perspire easily during sleep and pain. The tongue is coated white and is swollen.

Phytolacca is helpful in the rheumatism of syphilis, and when the pains are in the joints. Also when affecting the shoulders and arms, and when rapidly changing from one part of the body to another.

Pulsatilla is one of the very best remedies in the treatment of rheumatism in children, associated, as is so often the case, with gastric derangement. The tongue is heavily coated and the breath is offensive; there is lack of appetite and sometimes nausea and vomiting. Rheumatism comes on because of the disturbance of the stomach and liver. Rapid migration from joint to joint, especially from one side to the other, calls loudly for *Pulsatilla*.

Rhus tox.—*Rhus* is especially indicated in rheumatism occurring from exposure to damp, cold, raw weather. It affects chiefly the muscular and fibrous tissues. The joints are stiff and shiny, red and swollen. Exposure to the air causes unusual suffering. Affected joints must be kept warm and dry. If of the sub-acute variety soreness and stiffness are overcome by motion.

Bryonia is characterized by intense local inflammation. The parts are hot and look dark, or bright red. The joints are exceptionally painful, and although motion of them is exceedingly agonizing the patient is impelled to move in spite of the fact that it increases the suffering.

Cactus is adapted to rheumatic affections of the heart with sensation of constriction. Cannot lie down; must sit up to breathe. Sharp, lancinating pains in the cardiac region.

Besides these remedies *Cimicifuga*, *Arnica*, *Cantharis*, *Calcarea carbonica*, *Lycopodium*, *Rhus radicans* and *Apis* will be called for in individual cases.

The alkaline system of treatment, consisting of the administration of *Salicylate of soda* and of *Salicylate of lithia*, as well as *Salicylic acid* not combined with any other drug, is much favored by the old school and may sometimes be found palliative in violent joint sufferings. I have not often had occasion, however, to administer either, and after having watched their use in the hands of others am not disposed to believe they are as helpful as *Bryonia*, *Rhus tox.*, *Calcibicus*, the *Kalis* and other true and tried homeopathic reme-

dies. In sub-acute and chronic varieties of infantile rheumatism, as with adults also, I have learned to give the higher attenuations, even up to the one thousandth. In the more acute varieties I have administered the lower, rarely above the thirtieth, and often as low as the third potencies.

Rheumatic iritis will call for *Belladonna*, *Rhus*, *Gelsemium* and other general rheumatic remedies. It should be borne in mind that in rheumatism involving the iris the pupil must be distended by mydriatics in order to prevent adhesions. Rheumatism of strictly syphilitic origin will require anti-syphilitic treatment, as described in its proper chapter. *Nitric acid*, *Thuja*, *Phytolacca*, *Iodum*, *Syphilinum* and *Medorrhinum* being especially applicable.

CHAPTER XV.

REMITTENT FEVER.

General Considerations—Symptoms and Course—Diagnosis—Treatment.

General Considerations.—Children are more disposed to the remittent variety of malarial fever than the intermittent, especially in the more tender years. In an experience of four years in an intensely malarious district in the southwest it was found that children are often more susceptible than adults to this type of the disease. The ordinary ague, or chills and fever, characterized by complete intermissions, is very common among young children, but not so much so in those below two or three years as the remittent form of the disease.

Both remittent and intermittent fevers are ascribed to "malaria." They are more common in the fall of the year, prior to frosts, and in the south occur most frequently in swampy, paludal districts and in rich, alluvial agricultural countries recently opened to cultivation. Various causes have been given for the manifestation known as malaria. Some authors have contended that since it exists almost everywhere, being met with not only in the swampy districts in rich river-bottoms but on the open prairies, on ship-board and on mountain table-lands, it is caused by the differences between the heat of the animal system and the surrounding atmosphere and soil, and is due to purely physical problems, as evaporation, condensation, nerve shock, etc. But it has now come to be generally understood that it is directly traceable to certain minor organisms known as protozoa, that affect the nerve centers and especially the red blood corpuscles.

Heat, moisture and vegetable decomposition seem to be necessary to the development of malaria; yet, as stated, it is seen on ship-board and at very high altitudes. Those who favor the evaporation theory point to the fact that many marshy countries or sections of country are not subject to malaria. This is the case in the marsh regions of Ireland, Australia, Asia and some of the Pacific islands, and certain portions of Mexico.

Symptoms and Course.—Remittent fever, also known as bilious fever or bilious-remittent, presents a more continuous fever than the intermittent variety, or ordinary ague. It is usually preceded by gastric disturbances, coated tongue, the coating being thick and yellow or white and heavy, offensive breath, nausea, vomiting, headache in the frontal region, throbbing of the temples and some mental hebetude. Occasionally an attack of remittent fever is ushered in by a chill, but not often. There is generally a prodromal stage of two or three days of languor, peevishness and irritability. When fever sets in it is at first continuous, and the thermometer will show marked deviation from the normal; it sometimes runs as high as 104° or 105° , the child being intensely hot, restless and stupor. Occasionally the fever is so severe in young subjects as to cause convulsions, but this does not occur often. After lasting a few hours at considerable intensity it will begin to subside and the child will break out in perspiration, not profuse, only to become hot and dry again as before. In some cases the remissions are not very pronounced, the fever partaking a good deal of the character of continued fever, while in others it will subside so as to be almost absent for several hours at a time, when it will rise again and be about as severe as before. Occasionally cases will be met with in which the chill and heat are so intermingled that even while the child is very hot it will insist on being covered and kept snug, the slightest exposure to the air, especially while hot and moist, inducing shiverings and chilliness, with corresponding subsequent increase of fever.

Uninterrupted infantile remittent may go on for a number of days, in severe cases as long as two weeks. The stomach is more or less disturbed throughout the attack; the bowels are usually torpid, although diarrhea sometimes occurs; the lips become dry and scaly; there will be picking at the nose and slight bleeding from that organ. The spleen and liver show enlargement and tenderness, especially the spleen, and in pronounced cases the character of the fever and cerebral manifestation causes considerable apprehension lest the case be one of unrecognized typhoid fever. The remissions are usually more pronounced in the forenoon, the aggravations in the evening. On the occasion of the morning visit of the physician the child will be found to be doing well, apparently free from fever and trying to play. But early in the afternoon it becomes tired and languid and by three or four o'clock the

temperature rises, and from that time for several hours the fever will be as high as it has been at any time in the course of the disease.

Left to itself remittent fever will generally spend its force and end in recovery, after two or three weeks of quite severe illness, convalescence setting in promptly, and quick recovery ensuing, unless the malarial involvement shall have been very pronounced, when it may taper off in intermittent form, the child continuing to have ague for several weeks or even months. Should the infant be predisposed to brain trouble, or be a child of what is known as the fever type, convulsions may come on during one of the aggravations, rendering it exceedingly ill, often endangering and destroying life; so that while not necessarily a severe disease, in individual instances it may be destructive to life.

Diagnosis.—From strictly intermittent fever remittent fever is to be differentiated by the marked periodicity and regularity of stages of the former. Coming on with a positive chill or chilliness, ague is attended by regularity of chill, fever and sweat, followed by positive intermission of one, two or three days, depending upon its type. In remittent fever the fever is never really absent; it remits, is up and down, with some regularity, it is true, but it has less of chill, less of sweat, much less of apyrexia, and a great deal more of fever than is seen in ague. From typhoid fever it is to be differentiated by the absence of petechia, ilio-rectal tenderness, and the characteristic pea-soup diarrhea. Furthermore, the remittent fever gradations are very much more pronounced than in typhoid. The fever is up and down, rarely steady more than a few hours at a time. The gastric symptoms are more pronounced in remittent than in typhoid, the intestinal distention and disturbance much more pronounced in the latter.

Treatment—*Gelsemium* is perhaps the most useful single remedy in infantile remittent. The fever is of the *Gelsemium* type. The pulse is full, yet soft and compressible. The skin though hot is often somewhat moist. The case is not characterized by the intensity of nervous manifestations belonging to *Aconite*, and the evening aggravation is typically a *Gelsemium* condition. The tenderness of the spleen and soreness of the muscles are also covered by *Gelsemium*.

China is useful in cases characterized by greater tendency to pronounced intermissions. While not altogether free from fever at any time, yet some cases show such marked recession of fever in the morning and such a positive rise in the evening, as give to the case more the appearance of intermittent. When occurring during intense epidemics of malarial fevers of all types *China* will sometimes serve even better than *Gelsemium*.

Belladonna is always to be thought of in children of full habit, predisposed to brain symptoms. The fever rises and subsides

quickly; the face is flushed; carotids and temples throb and pulsate; the child rolls and tosses, and convulsions threaten or occur. I have rarely had occasion to go outside of *Belladonna* and *Gelsemium* in the convulsive type of infantile remittent.

Eucalyptus is accounted almost a specific in intensely malarious, swampy districts. The child sweats throughout the entire fever, and disposes to drowsiness, even to coma, rather than to restlessness or convulsions. The tongue is heavily coated, white or yellow; the breath is putrid; the child smells intensely feverish.

Podophyllum will be found beneficial in cases characterized by the so-called bilious vomiting and diarrhea. The liver is swollen and sore. The child looks yellow, even jaundiced, and there is diarrhea of thick yellow stools, with or without pain.

Arsenicum, especially *Chininum arsenicosum* is indicated when the case is marked by pronounced chill at the start and distinct periodicity shows throughout the attack.

Palatilla, *Antimonium crudum* and *Nuxvomica* may be indicated in special cases in which the digestive functions are disturbed. *Nux* especially will be useful if the patient has been previously treated with old school or domestic remedies, which have not cleared up the case.

Antimonium has proven a treasure with children whose stomachs have been deranged by candies, cakes, bananas, and other sweets and fruits. And as most children have gastric disturbances with their fevers it is one of the commonly used remedies in every case. It has heavily coated or mapped tongue, putrid breath, vomiting and pasty diarrhea with the fever.

Baptisia may be called for should the symptoms assume a somewhat typhoid character, the patient being dull and besotted, the breath putrid, mild delirium attending the fever, the whole picture being of the lower type.

Children suffering from remittent fever will need but light nourishment, cool, refreshing drinks, simple, bland articles of diet. Occasional spongings with cool water, and, if convulsions threaten, or are actually on, the wet pack is often demanded and very beneficial. A bath-towel or sheet should be wrung out of cool water and the naked child be wrapped in it from head to foot, colder cloths being applied to the head. Outside the wet sheet should be a dry blanket. It is surprising how quickly convulsions or high fever will subside under the use of the pack, which may be renewed as often as the symptoms demand. Convulsions are much more apt to supervene in this type of fever in children whose stomachs are overloaded and whose bowels are torpid. The latter should be kept reasonably open by enemata, and if the fever has come on in the first instance from gormandizing it may be well to use a mild laxative, as a teaspoonful of glycerine or like quantity of table-syrup in milk or hot water. *Nuxvomica* will, of

course, be thought of when this condition of the alimentary tract is present.

In masked remittent, following upon suppressed intermittent treated by *Quinine* and the various tonics, *Nux vomica*, *Pepsatilla*, *Lobelia*, administered as indicated, will usually promptly clear up the case.

A word in regard to the potency of the remedies to be used in remittent fever. Throughout the west and south it is quite the rule to give *Gelsemium* and *Baptisia* in low attenuations, even to the mother tincture, both in remittent and continued fevers. This was my practice for years, but I have learned better, and rarely have I given these remedies in later years below the thirtieth, to children. I believe cases are often spoiled and permanent cures retarded by the administration of remedies in the cruder strengths, and nowhere is this more true than in the treatment of malarial fevers of child-life. If *Cincha* is to be given it should always be given in the alternations and never as *Quinine* or other "active principle" of the drug.

SECTION III.

INFECTIOUS DISEASES.

CHAPTER XVI.

SCARLET FEVER.

General Considerations—Translar Theory—Epidemicity—Susceptibility—Symptoms and Course—The Eruption—Desquamation—Throat Symptoms—Tongue—Temperature—Complications and Sequelæ—Glandular Complications—Otitis Media Suppurativa—Kidney Complications—Rheumatism—Cardiac Complications—Other Complications—Diagnosis—Prognosis—Prophylaxis—Medical Treatment—Doct—Ventilation—Corticaceous.

General Considerations.—Scarlet fever is a specific fever, infectious in high degree and presumably contagious. Certainly in many instances a simple exposure of brief duration suffices to develop the disease. Its infectiousness is unquestioned. The specific poison producing it is possessed of unusual virility, and months, or even years, after the existence of scarlet fever in a room or house fresh cases may occur upon the exposure of susceptible children therein. A not uncommon source of infection is the exposure of infected bedding, clothing or the playthings of a deceased child which have been lovingly preserved.

Bacteriologists have not yet located and classified the specific germ of scarlet fever, although repeated efforts have been made to do so. Arguing from the generally accepted position of the profession of to-day that cholera, typhoid fever, diphtheria and other zymoses have been traced in their origin to specific causative bacteria it would seem that the microscope and culture-tube should have long ere this revealed the cause of the disease under consideration. The nearest approach to accurate investigations in this direction have been undertaken by Klebs, Klein, Marr and Eddington, all of whom have tried to trace it to a specific micro-organism possessing pathogenic properties, now generally believed to be but varieties of the ordinary pyogenic or pus-producing bacteria. Klebs pictured a bacillus which he termed the *monas scarlatinae* as long ago as 1880; but later authors have not dwelt upon the evidence offered to prove its specificity. So that at the present moment scarlet fever is one of the diseases in which a specific causative bacillus has not been found.

It has been held that the infectious principle arises from the epidermis and its secretions, that this is given off during the stage of incubation, and especially during the stage of desquamation; but there is lacking direct and satisfactory testimony to substantiate these claims. Children have handled large flakes of integumental debris from scarlet fever patients without resulting harm. On the other hand, the free shedding of the fine epidermic scales after the fever has spent its force is quite certain to infect susceptible children. It is believed that the lodgment of these flakes in clothing, bedding, upholstery, etc., and their subsequent exposure to warmth and light, is one of the most certain causes of subsequent outbreaks of the disease. And in treating a patient ill with scarlet fever it is well to keep the body so thoroughly anointed with some simple unguent, as neutral lard, olive oil, chemically pure coconut oil, cocoa butter or Vinolia cream, as to prevent the free throwing off of epidermic flakes to find lodgment in upholstery and other fomites, and to be carried into the throats of other children by the breath. An additional safeguard against this possibility lies in the removal of all upholstered furniture, carpets, curtains, clothing, etc., from the sick room, the eventual destruction of mattresses and bed-clothing used by the patient, and the thorough cleaning and disinfection of the apartment. It is impossible to exercise too great caution in this direction, even to repapering or re-calculining the walls and ceilings.

Tonsillar Theory.—A recent explanation of the possible cause of scarlet fever, one accepted by the author as worthy of respectful consideration, is the tonsillar theory. Operating independently of each other, Dawson of England, and Berge, of France, have expressed the thought that scarlet fever is due to invasion of the crypts of the tonsils by the *streptococcus pyogenes*, Fig. 23, or common pus-producing bacillus, no matter what



FIG. 23.

its origin, and the consequent development of a strictly septic fever of varying intensity and malignancy. In support of this theory they cite the fact that children with enlarged tonsils are especially liable to the disease; that with the atrophy of these glands at the age of puberty liability to attack by scarlet fever disappears; that even malignant cases in large families may not result in the infection of other children, as is always the case in whooping cough, measles and

diphtheria. These investigators hold that systemic invasion by

the *streptococcus pyogenes* occurs through abrasions of the mucous membrane covering the tonsils or lining their crypts; and that, doubtless, in innumerable cases the poison is developed from decomposition of particles of food lodged in the crypts, or, through auto-infection, by the absorption of ptomainic poison generated by the decay of the crypt epithelium from injury thereto by hard particles of food, etc. Certain it is that tonsillar children are more liable to scarlet fever than children having no tonsillar hypertrophy; that immunity comes almost invariably with puberty, with its tonsillar atrophy; that the disease is more malignant in subjects having bad tonsils. Still, this latter thought may be explained upon the ground that "glandular children" are generally the worst sufferers from all infectious diseases.

It is well to bear in mind in this connection that the tonsils are protective glands; that is, that it is the duty of their lymphocytes or lymphoid cells to take up and carry to their lymphatic glands bacilli and other noxious agents for their destruction therein. If the tonsils are healthy they not only do not generate poison within themselves, but serve to protect the system from invasion by bacilli in so far as they are able. If, on the other hand, they are enlarged, abraded or inflamed, they not only cease to be able to perform their protective function, but serve as a locus for infection by their own toxins and various specific bacteria. Hence the necessity for healthy tonsils and the danger from diseased tonsillar glands. By directing treatment to the tonsils in the children of our regular families we can beyond doubt often save them visitation by infectious diseases, especially those having the throat as a local seat. Certainly the tonsils have an important function to perform, and their wanton removal or careless abandonment to adenoid enlargement or ulcerative destruction is just cause for censure.

The intimate anatomical and physiological relationship existing between the mucous membranes and skin is credited with the integumentary involvement of scarlet fever. This covering of the body is the external mucous membrane, or, more properly speaking, the mucous membrane is the internal skin. Invasion of the tonsils and the development of faucial and throat inflammation are soon followed by burning of the covering of the body; and, usually, in direct relation to the severity of the throat symptoms is the external fire. Prepuccial or clitoric irritations acting reflexly may influence the development of the eruption adversely, or intensify it.

The study of the etiology of scarlet fever is highly interesting. Bacteriologists are pursuing it with assiduity, and perhaps before the ink on these pages is dry altogether new theories may be presented. The tonsillar theory meets with most favor at my hands, and I am constrained to believe scarlet fever to be a typical septic

fever, caused by the introduction into the system of the *streptococcus pyogenes*, or pus bacillus, chiefly through abrasions of the tonsillar mucous membrane, its force being spent, first, upon the throat and immediate connecting glands; secondly, upon the integument; and thirdly, upon the glandular system, especially those glands having epithelial-lined ducts.

Epidemicity.—There is a marked difference in intensity of epidemics, some being so mild as not to be attended by any considerable mortality, while others are so severe as to devastate whole families of children and large neighborhoods or districts in a single season. This difference in degree of severity wholly lacks satisfactory explanation, but doubtless depends in good part upon the general hygienic condition of the cities or sections of country attacked, and upon states of the weather. Epidemics occurring in the colder weeks of early spring or at the close of hard winters are likely to be attended by larger mortality than those occurring in midwinter or at the close of a mild winter season. A peculiar feature which has been noticed in country practice is the fact that the course of the disease is often limited to a comparatively narrow strip of country lying in the course of the prevailing winds. This peculiarity is also observable in some cities and towns, an epidemic being limited to an unsanitary section or to a section whose topography and soil vary from that of other portions, low, damp, alluvial districts being more subject to its visits.

Susceptibility.—The susceptibility is not as great in this as in other infectious fevers, nor is it as likely to attack whole families as measles and diphtheria, this looking toward the confirmation of the thought that its poison is likely to be generated within the individual, or to find lodgment only in susceptible (tonsillar, surgical, puerperal) subjects.

Nursing children are not very susceptible to scarlet fever, but sixty-five per cent of cases occur before the age of five years, showing it to be a disease of the earlier years of child-life. An additional thirty per cent of cases occur in the second five years of life, and thus but about five per cent are reserved for persons above ten years of age.

Pregnancy and lactation afford protection, but it has been held that the fetus in utero may suffer from or even be born with the disease fairly on. This statement should be taken with allowance. I have never met with such a circumstance nor have I read of a well authenticated instance of this character.

Surgical states render the individual liable to infection, open wounds affording excellent sites for the introduction of the poison. The surgeon who also does general practice cannot be too guarded about going from scarlatina to the operating room. This caution applies also to the accoucheur and his relation to the lying-in room. The poison of scarlet fever furnishes the etiological factor

of puerperal septicemia altogether too often. I have known a number of instances wherein a pregnant mother who had nursed a child, ill with scarlet fever, has succumbed to puerperal septicemia, weeks or months afterward, presumably from infection from her still desquamating child or from infection through means of its clothing or her own; it not being thought probable that the development of the disease so long after exposure can be due to the fact that the poison has been held dormant in the maternal system.

As a rule, one attack of scarlatina affords immunity for life. Rarely patients have been known to claim having had two distinct attacks, but in no instance of which the author has personal knowledge is there authentic evidence of this double experience. Nurses will occasionally have duplicated attacks of "scarlatinal throat" while taking care of patients ill with this disease, but a second fully developed infection is exceedingly rare, if, indeed, it ever occurs. Scarlatinal septicemia, on the other hand, may and does occur in the puerpera who has had scarlet fever in childhood.

Scarlatina and scarlet fever are synonymous, one and the same, being simply varying intensities of identical infection. A child ill with the mildest form of scarlatina may infect another in whom will develop a most malignant, even fatal, type of the disease; and, conversely, very mild cases may trace their origin to an exceedingly malignant manifestation of the fever. This fact should ever be borne in mind in practicing isolation, and in guarding against the spread of the disease. Proper precautions have not always been taken in the milder cases, commonly called scarlatina, the use of which term is more melodious, or, rather, less unmelodious, to the lay ear than the more correct and far more precautionary name of scarlet fever.

Symptoms and Course.—The period of invasion and incubation of scarlet fever is brief. Without being sufficiently ill, mentally or physically, to attract attention at the time, it will be remembered upon the development of acute symptoms that the child has not been real well for a few days past; has been cross, fretful, out of sorts; or, perhaps, it has been tired, languid, not caring to play; listless, dull, lacking ambition and its usual appetite. The symptoms may set in at once upon exposure, almost immediately in some cases, certainly within a day or two in very young children, or they may not begin until a week or even ten days after invasion. In cases of laggardly development the mental symptoms enumerated are soon followed by throat symptoms. The child complains that it hurts it to swallow, and its speech becomes thick and inarticulate. Or, perhaps, with the mental hebetude there will be no complaint, but the mother's attention will next be attracted to an external fullness of the neck

under the angles of the jaw, eliciting throat symptoms only upon inquiry.

But this is not the usual course. Generally the invasion is sudden. Within a day or two after exposure the child will have a sharp, well-defined chill, attended or preceded by nausea or, and more often, sudden vomiting. Sometimes this vomiting occurs as the very first appreciable symptom, coming on without warning and even in the middle of the night. Following the initial chill, or emesis, or both, the temperature bounds from normal, or, perhaps, from a degree sub-normal, to as high as 103°, 104° or even to 105° F. Out of proportion to the temperature, moreover, flies the pulse, which is more rapid in the initial stage of scarlet fever than in any other disease. It often develops to a beat of from one hundred and twenty to one hundred and forty or one hundred and sixty per minute within a few hours after the first manifestations of the disease. Given, in a child who has not had scarlet fever, sudden vomiting, with or without chill, slight throat symptoms and the characteristic rapid pulse, we should inevitably direct our inquiries toward the possibility of scarlet fever.

In northern climes the disease may develop suddenly and alarmingly within a few hours. In southern latitudes it is usually of milder form and the violence of onset is not so marked. In highly susceptible children the initial symptoms may manifest themselves in the way of profound shock to the nervous system, the child presenting all the evidences of being very ill from the start. These cases are apt to be severe, the profundity of shock being due either to the invasion of the system by poison unusually virulent in character or to an unusually delicate and susceptible nervous system. In either event it is sage to go hard with the patient and the prognosis should be guarded. This seriousness of invasion may be due, in fact, is nearly always due, to another cause, viz., some constitutional dyscrasia; as tuberculosis, syphilis, syrosis, psora, etc. And here the physician should not lose sight of the teachings of Hahnemann and Granvogl in relation to dyscrasia in treating his case. The constitutional miasms of Hahnemann are important factors in prognosis, and success or failure in treatment will often depend upon their due recognition.

The Eruption.—Within twenty-four to thirty-six hours after the ushering in of the positive symptoms there will be seen at first a slight blush on the face and neck, which soon develops to marked redness, a positive scarlet hue, from which the disease takes its name. This eruption may first be noticeable on the upper part of the chest or on the back, and is different from that of measles in that the latter is an eruption on the skin, while in scarlet fever it is of the skin. Measles is rough, gritty, sandlike to the touch; scarlet fever is smooth, glistening, shiny. Originally it consists of isolated spots of eruption with a more or less distinct areola around each one, but these soon coalesce and con-

siderable areas of integument become uniformly florid. The face becomes quite red, in severe cases positively livid, but around the mouth and at the alae nasi there remains a whiteness that is very marked in comparison with the lividity of the cheeks, forehead and neck. This whiteness around the mouth is not present in other eruptive diseases and helps us to differentiate scarlet fever from measles and mild cases of variola.

A popular method of diagnosing the eruption of scarlet fever lies in running the ends of the fingers rapidly across the chest, back or face, or up and down the thighs or legs, exercising moderate pressure. There will be left a positive whiteness lasting for an instant before the scarlet blush re-occupies the traced lines. In no other eruptive fevers, except acute erythema, which lacks throat symptoms and often has or may be dependent upon renal complications, is this sign so marked, although in many of the simple fevers in florid children there may be an erythema of considerable positiveness in which it may be developed in lesser degree. Here the absence of the characteristic pulse, the initial vomiting and the *linea oris et nasi* will aid us in reaching a diagnosis. But it is not necessarily to the physician's discredit if he cannot always make his case clear at once, for it is sometimes quite impossible to differentiate absolutely between simple tonsillar inflammation with positive erythema and mild cases of scarlet fever, or *scarlatina simplex*, until the desquamative stage of the latter has been reached.

There are, also, certain drug eruptions which have to be looked for. Some children are very susceptible to the action of quinine, and where it has been used in domestic practice or by an old school predecessor for the purpose of "breaking a cold," we may have a quinine erythema confronting us. In homoeopathic practice the use of *Belladonna* in the lower attenuations as a prophylactic may set up a *Belladonna* rash which is quite confusing. Careful inquiry will usually put the physician upon the right track and the diagnosis of the true scarlet fever eruption may be made with reasonable certainty and promptitude in every well marked case.

Commencing on the face, neck, or breast, within twenty-four to thirty-six hours after the ushering in of the initial symptoms, the eruption spreads rapidly but not always uniformly, as if from extension, from the initial blotch. It may early show itself on the backs of the hands and fingers and on the backs of the feet. When occurring on the fingers it is apt to be less smooth and glistening than on the face and chest, becoming almost pimply in character. The fingers and toes look puffed and swollen and feel stiff and clumsy. Upon desquamation their integument is sometimes thrown off in large flakes, those from the fingers being almost like glove tips in occasional cases of unusual severity,

those from the feet and toes being sandal-like in the worst cases. The thick skin of the heel may be shed in one piece.

The eruption occupies from two to four or five days in spreading over the body, and hardly has it reached full development before desquamation sets in on the parts earliest involved. In mild cases this may be simply furfuraceous and made manifest only upon briskly rubbing the skin, when fine bran-like scales will be ruffled in abundance. In more marked cases, where the integumentary fire has been severer, there will be detached without difficulty long strippings or flakings of skin of considerable size; while in the severest cases the skin may peel off in large areas, and the "gloving" of the fingers and toes and the "sandaling" of the feet will be extensive enough to quite justify the use of these words in this connection.

Desquamation.—This constitutes a peculiar feature of this disease and indicates the positive death of the epidermis. This cannot be from the intensity of the fever alone, for many febrile conditions are accompanied by a much higher temperature-range without the slightest appreciable desquamation. This process, therefore, indicates that a feature of scarlet fever is an idiopathic inflammation of the skin, its glands and ducts. And to preserve the cuticle from the destruction of the inflammatory process should be one of the objects of treatment.

The exfoliative process lasts from a few days to many weeks, depending upon the severity of the integumentary involvement and previous health of the skin. It belongs to no other fever and is, therefore, pathognomonic. Its positive presence establishes the diagnosis beyond cavil, and often aids in locating the cause of nephritic complications or sequelæ, rheumatism, endo- or pericardial complications, suppuration from the middle ear, glandular involvements, etc. So long as it lasts there is danger of infecting susceptible subjects and fomites, and from the hygienic viewpoint it is not safe to allow a child convalescing from scarlet fever to attend school or mix indiscriminately with other children of impressionable years until this process be fully completed, from six weeks in mild cases to fully three months in severe ones.

Throat Symptoms.—The throat symptoms have special significance and are most important. Whether the tonsillar theory be proven the correct one or the disease be eventually traced to specific micro-organism origin, the fact remains that the throat is early and usually seriously involved, and in many cases is the portion of the economy most disastrously affected. Attention is early attracted to it by the complaint of the child that its throat is sore. Inspection reveals a generally red faucial membrane, the palate being swollen and adjacent tissues puffy. Deglutition is difficult; the mouth is partially filled with a sticky saliva or is dry, red and parched. The tonsils are swollen and dark red in

appearance, and in the anginous variety, the *scarlatina anginosa* of early authors, soon become covered with white or yellow speckings, the subsequent site of more or less deep ulcerations, which sometimes involve the entire glandular structure on one or both sides and present a diphtheritic appearance. When this condition is marked the fetor oris is intense and penetrating. The systemic invasion is profound, a greater or lesser degree of coma supervenes, and the case takes on an exceedingly serious aspect. Here, again, the tonsillar thought presents itself.

In almost invariable proportion to the degree of involvement of these glands the cases are mild or severe. And since those patients in whom extensive or intense tonsillar involvement shows early are the ones developing the severest constitutional affection it would seem that there must exist causative relationship. In severe cases the throat symptoms manifest themselves early and continue throughout the course of the disease. In mild cases the angina may be simple and non-characteristic.

Tongue.—The tongue of scarlet fever presents appearances peculiarly its own. In the initial stage it is coated white but studded here and there on the white background or base with protruding bright red papillae, giving to it the so-called "strawberry tongue" of this disease. When this condition is typical it is a diagnostic sign of much value. Later, as the gastric symptoms incident to the early stage subside, the white coating disappears and the bright red papillae stand out prominently on a red background, being especially prominent at the tip and in some cases becoming quite inflamed and sore. As the disease progresses, especially if the case take on a typhoidal form, the general appearance of this organ is very like that of the typical typhoid tongue.

Temperature.—The temperature range in scarlet fever is not pathognomonic as in typhoid fever and does not possess the diagnostic value of the pulse. In mild cases it ranges from 101° , 102° to 103° Fahrenheit, while in the more malignant types it may climb well up the scale, even reaching the exaggerated figure of 110° or 112° . I have never seen it higher than 106° , but then I have met with but few fatal cases, though having passed through a number of mild epidemics and some very severe ones. Just as the onset of this disease is sudden so is the ascent of the



FIG. 24.

mercury sharply defined. It may reach its highest point as the eruption is developing to its full extent, or in severe cases it may go up and down as the patient is better and worse. In typhoidal cases it may remain quite stationary for several days between

103½° and 103°, or higher. Its decline may take on the stair-step or zigzag form peculiar to lysis, or it may take a sudden fall and settle from its maximum degree to almost normal within a few hours.

In fatal cases, if death ensue from non-elimination, from carbonic acid or uremic poisoning, or from a combination of both, or from cerebral paralysis due to excessive heat of the blood, the temperature is likely to be high at the time of death. On the other hand, should a fatal issue ensue during the decline of the eruption or from its recession, especially should nerve shock ensue, or occur from septicemia, long continued and consequent exhaustion, the temperature may fall and be normal, or even below normal, before death. Excessive temperature should be carefully guarded against, but not with circulatory depressants and so-called antipyretics; and, on the other hand, the rapid fall of the mercury when the patient is manifestly not doing well is a symptom for careful watching.

Complications and Sequelæ.—Of all the diseases of child-life none is more likely to leave annoying sequelæ or be attended by such serious complications as scarlet fever. Did the disease spend its force as a blood ferment or simple inflammation of the skin it would not be so dreaded by profession and laity alike. But it is often accompanied by complications which tax the skill and resources of the physician, and which not infrequently, in strumous subjects, especially, maim for life. Hence the necessity for the utmost care and watchfulness throughout the whole course of the case, from initial symptoms to completion of the desquamative process; and hence the necessity for the closest adherence to the homeopathic law and the exhibition of the most painstaking care in directing treatment toward the patient personally and his whole history, *antecedens et præsens*. At no time in child life are diseases as apt to show as during or following an attack of scarlet fever or other blood-poisoning state; therefore, the necessity for prescribing for not alone the fever, the throat symptoms, the kidney or other complications, but for the patient, complications included.

GLANDULAR COMPLICATIONS.—During the height of the fever and as suppuration of the tonsillar membrane and parenchyma occurs, and even before the process has gone thus far, the sublingual, sub-maxillary and parotid glands become involved by bacterial or toxine invasion. Enlargement or tenderness quickly ensues and suppuration not infrequently follows. The symptoms and course are those of adenoid inflammation everywhere, in strumous subjects dragging along over a period of weeks with extensive destruction of glandular structure. Even the cervical glands may take on the inflammatory process; but suppuration is more apt to occur in the parotids than in other glands. When the case takes the form of general septicemia remote glands, as those of the

axillæ and groins, become enlarged and in occasional extreme cases suppurate.

OTITIS MEDIA SUPPURATIVA is a complication to be dreaded from the fact that the ossicles in subjects of tender years are liable to destruction or partial or complete ankylosis and consequent permanent impairment of hearing. The drums may suppurate and be destroyed and the eustachian tubes, or either of them, become occluded. The initial symptom is earache, or pain in the zygomatic region, with sharp lacerations in and about the auditory meatus, and throbbing and some swelling of adjacent parts. In rare cases there is absence of the symptoms of inflammation, and the presence of pus in the canal and meatus first attracts attention to the ear. As a primary complication suppurative otitis presents about the same course that it does as an idiopathic ailment or accompaniment of other disease. As a secondary complication it is very prone to run a continued or intermittent course extending over a period of months or even years.

KIDNEY COMPLICATIONS.—Nephritis is by far the most serious of the various complications of scarlet fever. It is a not uncommon attendant upon the desquamative period and arises from taking cold by exposure of the new skin to draughts of air, or by exposing the feet, the bottoms of which have been especially and extensively shorn of their heavy epidermis, even though hose-clad, to the damp or cold ground or cold floors, before a sufficient length of time has elapsed for new skin to form and mature. Nephritis also occurs directly from the infection of scarlet fever through its irritative effect upon the epithelium of the tubuli uriniferi, and is pre-eminently a post-scarlatinal affection. Albuminuria is quite apt to be present during the more acute febrile excitement, but as this subsides the albumen disappears from the urine and may be absent for days or even weeks before the real setting in of post-scarlatinal nephritis. This complication comes on insidiously, as a rule, after the attending physician has discontinued his visits to the case. It may be first manifested by slight puffiness under the eyes, and edema of the dorsum of the foot at the base of the toes. Inquiry reveals the information that there is diminished amount of urine, perhaps turbid and attended by frequent calls to micturition; or the quantity may be larger than normal for a few days, the decrease following this stage of irritation. Many cases are ushered in by headache, chilliness, slight rise of temperature, nausea, vomiting, and mental depression or dullness. Nervousness manifests itself to a high degree in occasional subjects and if the suppression be almost complete uræmic symptoms, twitching, convulsions, coma and death may early supervene.

Post-scarlatinal nephritis is apt to determine its course quickly. It rarely terminates in confirmed chronic Bright's disease. I have met with individual instances, however, where the involve-

ment seemed to be quite gradual, where the urine became very scant indeed, but few ounces being voided in the twenty-four hours, albumen being present in considerable volume and general dropsy following the cases, lasting for weeks, yet making complete recovery eventually. It may be worthy of note that the cases referred to occurred in the warm, equable climate of southwestern Texas, which had much to do, doubtless, with their favorable outcome.

The variety of nephritis accompanying or following scarlet fever is the acute glomeruli. It is the glomeruli and epithelium of the tubuli uriniferi that are principally involved. Chemical and microscopical examinations reveal granular, hyaline and epithelial casts, albumen in quantity and blood and pus in severe cases. Anuria may be complete and is usually a most unfavorable sign, though Whitelaw records a case ending in recovery after there had been total suppression of the urine for twenty-five days. In mild cases improvement soon sets in under proper treatment and two or three weeks suffice to effect a cure. In severe cases not ending fatally improvement is more gradual. The albumen becomes less, blood disappears from the urine, the quantity increases day by day till the normal amount is reached; the dropsy decreases; the heart's action, which has been labored and slow, or excited, rapid and irregular, improves; the appetite increases and within a few weeks, or months at worst, recovery is assured. Patients suffering from this complication early in the winter or in midwinter must needs be taken care of until the warmer months of spring or the early months of summer. All these will do well to change residence for a few weeks or months, if residents of the northern or middle states, to the warmer and more equable climate of the western gulf states, especially to the non-malarious and dry climate of southwest Texas.

RHEUMATISM.—This is often seen as a complication or sequel of scarlet fever and is a troublesome affection. The joints, chiefly the wrists and ankles, though the knees, elbows, shoulders and hips may be involved, take on rheumatic pains, soreness and stiffness, and in aggravated cases may develop permanent deformity or suppurative synovitis. Usually the complication is a mild one, but it may be severe and cause great suffering, its course not varying materially from that of moderate articular rheumatic fever. Should acute synovitis ensue suppuration is likely to follow, the case taking on all of the characteristics of septicemia. Here the complication is due to infection of the synovial fluid by the poisonous cocci and toxins of the disease. Or, from its affinity for the serous membranes, the synovia becomes involved primarily and suppurative synovitis follows.

CARDIAC COMPLICATIONS.—As may be readily imagined, cases in which rheumatic complications are present are liable to endocardial and pericardial involvement. In fact, the serous

membranes may all have their secondary disturbances. Endocarditis, characterized by rapid and tumultuous heart action, dyspnea, valve lesions, etc., may set in early in cases in which the eruption does not develop fully, or in those in which its recession occurs and the complication becomes more serious than the disease *per se*. Or it may be present as the eruption fades and the fever runs its course, in which event it is apt to pursue a less positive course and exhibit as a sub-acute affection easily overlooked. The heart should be carefully watched in all cases of scarlet fever.

What has been said of the endocardium applies also to the pericardium. Pericarditis is not, however, as common an accompaniment of scarlet fever as endocarditis. When it occurs it is as an attendant upon suppurative synovitis and the suppurative form of this complication is present. I was a witness, some six years ago, to the opening of the pericardium with the scalpel and the withdrawal of eight ounces of a straw-colored albuminous fluid, resulting from acute pericarditis following scarlet fever.

LOBULAR PNEUMONIA, SUPPURATIVE PLEURITIS, HEPATITIS and consequent JAUNDICE, ACUTE DIARRHŒA and even DYSENTERY may present themselves as complications of scarlet fever. Lienteric troubles are much more common to measles than to this disease, however, and paralysis, so common to diphtheria, is not usually associated with scarlet fever. Meningitis with convulsions may follow upon a sudden recession of the eruption, which must be religiously guarded against. It manifests itself in the manner usual to cerebral and meningeal disturbances, and is almost invariably attended by an unfavorable prognosis.

Diagnosis.—The diagnosis of scarlet fever is not usually difficult. While certain drugs may cause an erythema somewhat like its blush, and while measles has been confounded with it, and while the erythema of lobar and even of simple fever, may cause a glow of the skin not unlike the scarlet fever rash, yet in none of these disturbances are there present the unusually rapid pulse, the sudden nausea, the white line round the mouth, and the albumen in urine of scarlet fever, not, however, always present, in its incipency. Nor are the tracings of the fingers so positively distinct. The throat symptoms, too, call attention to this ailment, and, of the diseases to be differentiated, are present in tonsillitis alone. Measles has a longer period of incubation, is attended by catarrhal hoarseness and conjunctival injection and effusion, the rash appearing first in the roof of the mouth and buccal membranes and, externally, first upon the face and in blotches; whereas, the eruption of scarlet fever appears primarily upon the upper part of the chest and throat, is smoother than that of measles and is not seen in the mouth. Nor is it attended by hoarseness, lachrymation and the hoarse cough of measles.

There is no likelihood of scarlet fever being confounded with variola, varicella or varicella, the isolated, elevated and afterwards vesicular character of the eruption of the former disease being alone sufficient to prevent confusion, while varicella is so mild and insignificant an ailment as not to be seriously thought of in this connection.

Scarlet fever has to be differentially diagnosticated from diphtheria when the throat involvement is severe. The prodromata are different and the onset of scarlet fever is far more sudden. Diphtheria is attended by lassitude and prostration in marked degree, and from the initial evidence of throat involvement that organ is "first, last and always" the chief seat of disease. In scarlet fever, on the other hand, the initial symptoms are characteristic and it is only as the disease progresses that the "septic throat" is observed. There are many points of similarity when this condition obtains. In malignant cases of both diseases septic invasion of the throat occurs from the development of ptomaines due to the destructive processes. But the matter, shreddy mucous accumulations of the scarlet fever throat are not like the greyish membrane of diphtheria. Scarlet fever may have a secondary false membrane made up of plastic exudate developing on the fifth or a later day, but diphtheria has a more substantial membrane and generally from the onset. Membranous formation is nearly always present in diphtheria, while in scarlet fever it occurs only in malignant cases, those attended by exceedingly high temperature and brain symptoms from the start. Glandular involvement is much more common to scarlet fever, and the upper portion of the fauces and nares is more likely to be affected, the preference of diphtheria being for the larynx and trachea. Paralysis does not often belong to scarlet fever nor does nephritis commonly go with diphtheria. The membrane of diphtheria yields to proper dissection, while that of scarlet fever is less easily acted upon. Nasal and conjunctival symptoms, as excoriating cornea, etc., are more probable attendants upon scarlet fever, while dyspnea and asphyxiation are more characteristic of diphtheria.

The culture tube will help us in our differential diagnosis. It is now universally acknowledged that the Klebs-Loeffler bacillus is the specific causative factor in diphtheria. At least, it is always present. This is a micro-organism of dumb-bell shape and frequently knobbed along the rod connecting the terminal enlargements. It is immobile, not possessed of spores, is separated by staining with alkaline methylene blue, and is susceptible of cultivation and development in proper culture media, as milk, blood-serum, bouillon, etc., within twenty-four hours. In large cities the health departments are establishing depots for the examination of inoculated media, thereby furnishing positive information to the practitioner upon which to base differential diagnosis.

Prognosis.—Epidemics of scarlet fever vary greatly in intensity and malignancy. Some are unusually mild and the mortality is small. Again, an epidemic may be exceedingly severe and baffle the skill of able practitioners, sweeping patient after patient before it with the ruthlessness of diphtheria. In mild climates it is apt to be mild, in colder climates, especially those combining humidity and cold, it is more fatal. In cold, raw, spring months with changeable weather it is usually more dangerous. The greatest mortality occurs in very young children and in those of strumous diathesis. Septic invasion is more likely to be general and profound in tuberculous subjects, and when "mixed infection" from vicious throat ulceration operates the prognosis is always grave. The pulse is more significant in scarlet fever than the temperature. Flaggings or irregularity is always a cause for suspicion. Death may ensue from pneumonia, from endocarditis or from exhaustion due to the protracted glandular, pleuritic or joint suppuration incident to septic aspiration, etc.; also from repeated reinfection with consequent re-development of acute pneumonia. Nephritis is not apt to be fatal unless the involvement of the kidneys is extensive and severe. When death is to occur from this complication the story is soon told. Recession of the eruption always justifies a guarded prognosis. Meningitis and convulsions are a not infrequent accompaniment of this misfortune. In rare cases the extension of otitic inflammation will result in mastoiditis, subsequent cerebellar abscess and death. Finally, the prognosis of scarlet fever may depend largely upon the hygiene; poor nourishment, bad nursing, foul air and filthy surroundings all having their influence for the bad. And, conversely, favorable surroundings should influence the prognosis favorably in the absence of constitutional dyscrasie prejudicial to recovery.

Prophylaxis.—Every case of scarlet fever should be isolated and no one not actually necessary to the well-being of the patient should be allowed access to the sick-room. While not proven to be directly contagious scarlet fever is intensely infectious. Debris from the patient finds ready lodgment in the clothing and hair of attendants and visitors and is readily transmissible to others. Physicians' visits in the scarlet fever room should not be unnecessarily protracted, and nurses in regular attendance upon a case should under no circumstances be permitted to mingle with other people. Wash goods should be worn in the sick room, and the laundrying should always be done in chemicalized water. All unnecessary furniture should be removed; and if there are other children in the family, scrubbing, re-painting and re-calculining should be thoroughly done before allowing them the use of the hospital apartment. For school purposes uninfected children had best be sent from home until desquamation of the sick child is complete and until the painter has done his work. There should be absolutely

no communication from the sick-room with the outside world except that which cannot possibly be avoided. The disease has been communicated by note or letter more than once. The medical attendant is not likely to carry infection if his visits are brief and if he is careful. In malignant cases he should wear a rubber or cambric gown and should thoroughly asepticize his hands, face, beard and hair before visiting other children. Under no circumstances should he go directly from the scarlet fever room to the lying-in chamber or to perform any capital operation. While I quite agree with the views of Dr. F. H. Orme of Atlanta, Ga., as expressed in an admirable paper, titled "To What Extent Do Physicians Carry Infection?" presented to the American Institute of Homeopathy at its meeting of 1894, in which he holds that the possibility of medical practitioners' spreading infection is slight indeed, I cannot refrain from uttering these words of caution. A single death laid at the physician's door through unjustifiable carelessness is enough to forever bedim the conscience of the honest man.

The disinfection of the sick-room after the patient has been moved, and the destruction of carpets, bedding, mattresses, clothing, and the like properly belong to the state; and I endorse Dr. J. H. McClelland, of the Pennsylvania State Board of Health, in saying that the state should reasonably compensate for and destroy every article of furniture and all fomites which have been used in the scarlet fever and other infectious sick-rooms.

Failing in this it becomes the duty of the physician and parents to see that thorough cleaning and disinfection be practiced. Everything that can be spared should be destroyed. All bedding should be burned. A few dollars' worth of false economy may cost hundreds in doctors' and undertakers' fees, and many human lives. Where people refuse to consent to this destruction, and there are no ordinances to compel it, disinfection of bedclothing should be undertaken by boiling it in bi-chloride of mercury water, one to one thousand or two thousand, care being taken not to allow those conducting this work to become mercurialized by steam-inhalation, etc. Furniture, floors, bedsteads, window and door sills, facing and wood-work, closets, etc., should be thoroughly treated by hot water and soap or bi-chloride water, and subsequently with scalding water; and, finally, fresh air should be allowed to circulate freely through the sick-room, halls, closets, clothes-presses, etc., for at least a week, day and night, before the room is again ready for occupancy. The more thorough the work, the closer the attention paid to every detail, the greater the probability of immunity from subsequent sick-room infection. The burning of sulphur in a closed room possesses but little if any value. Thorough antisepsis and sterilizing cleansing are the *measures*.

MEDICAL PROPHYLAXIS.—In July, 1799, Hahnemann first gave *Belladonna* as a possible prophylactic of scarlet fever. While treating a case he "resolved in this case of scarlet fever, just in act of breaking out, not to act as usual in reference to individual symptoms, but if possible (in accordance with my new synthetical principle) to obtain a remedy whose peculiar mode of action was calculated to produce in the healthy body most of the morbid symptoms which I observed *combined* in this disease. My memory and my written collection of the peculiar effects of some medicines furnished me with no remedy so capable of producing a counterpart of the symptoms here present as *Belladonna*." His first application of it was in one dose of the "1-132,000th of a grain of the extract, which according to my subsequent experience is rather too large a dose." (Lesser Writings, p. 379.) In this patient the disease seemed to have been aborted by that dose and another one the day following, and arguing that a remedy capable of quickly checking the fever must be its best preventive he was led to use it as a prophylactic. A considerable number of cases are recorded by Hahnemann as going to substantiate the thought enunciated which are seemingly confirmatory of his views, and from his time till the present this remedy has been given by his followers both as a prophylactic and modifying agent. The hypothesis upon which it is prescribed is not an unreasonable one, old school writers and quasi-homeopaths to the contrary notwithstanding. The occupancy of the system by any disturbing drug, if its action be not debilitating, renders its invasion by other poison less easy. And if it be a fact that *Belladonna* is capable of producing symptoms and effects like unto scarlatina, and if it be a fact also that drug-agents operate along the line of similia, or by affinities, then the idea of the gradual occupancy of the system by safe doses of this or any other drug having affinity for the tissues and organs for which the disease-producing factor has affinity is not a wildly chimerical thought. The gradual ingestion of an attenuation of *Carbolic acid* is also a prophylactic proceeding of value. A dose of either of these remedies, especially *Belladonna*, in medium attenuation, once or twice daily for several days following exposure, seems often to render susceptible subjects immune for the time being. And should the disease develop in spite of this effort at prophylaxis its course will usually be somewhat modified. To quote here Hahnemann's distinction of types and epidemics, "The remedy to be prophylactic must be homeopathic to the epidemic." Medical prophylaxis has much in its favor and no argument against it, provided, always, that it be not so completely relied upon that other prophylactic and sanitary measures be neglected.

Medical Treatment.—The initial symptoms of scarlet fever are often, as has been stated, of the gastric variety, as nausea and vomiting, usually sudden and of brief duration. Generally, if

cases are seen thus early, these symptoms are the ones which would be prescribed for, giving especial attention to the epidemic remedy. *Ipecac*, for the sudden vomiting, will reach most cases, but *Pulsatilla* and *Antimonium crudum* are also occasionally called for for persistent gastric symptoms.

Rarely, however, does the physician see the disease until headache, sore throat and fever are present. The redness of fauces and tonsils, together with the flushed face, throbbing carotids, injected conjunctiva, suggests *Belladonna*, and, indeed, in fairly mild epidemics this remedy alone will often carry the patient through. In the *Belladonna* subject the facial discoloration is dark red, the tonsils are swollen, the throat is dry and constricted, the headache is more marked than in the *Acute* case, and there is not the thirst, restlessness and incessant tossing of the latter. The *Belladonna* eruption is smooth, the skin red and shiny, even glistening, or it may be darker and mottled.

Acute will best suit those cases attended by sharp rise of temperature, rapid, sharply defined, dichromatic pulse, intense thirst, increasingly intense heat, bright redness of the tonsils, pungently hot, dry skin and the mental anxiety of the drug. Neither *Acute* nor *Belladonna* is very likely to be called for after the first day or two of disease. If, however, it should happen to run an unusually mild course, unattended by complications, either may be the appropriate remedy throughout and all that may be needed.

Gelsemium is useful in those cases in which the *Acute* case is dulled. The patient is quiet and listless, the face swollen and sodden, and prostration is present in considerable degree. The *Gelsemium* case is stupor, the pulse is throbbing, yet compressible, the skin, though hot, is not intensely hot and dry as under *Acute*, and there is not the constriction and dryness of throat of *Belladonna*. *Gelsemium* is suited to cases in which passive congestion, capillary stasis, occurs. Without claiming it to be a scientific method of selecting a remedy I am led to give *Gelsemium* in the initial stages of this and other fevers when neither *Acute* nor *Belladonna* seems to be fully indicated.

Bryonia, although not often indicated in the early stages, is yet appropriate to cases characterized by slow development of the rash. There will be throbbing headache, aggravated by cough, and nausea on motion of any character. Because of the absence of prompt development of the eruption meningeal symptoms are early manifest. When these are coincident with high fever, flushed face, dry throat, etc., *Belladonna* may be the remedy; or, symptoms arising from meningeal complications may be so acute and æsthetic as to call promptly for *Acute*; but when arising from non-development of the rash *Bryonia* does excellent service and should not be overlooked.

Veratrum viride succeeds to the place made vacant by the subsidence of the more acute symptoms of *Acouite*. Its pulse does not have the sharply defined stroke of the latter remedy; it is rather compressible under the fingers, and is full and flowing. The skin is more moist than under *Gelsemium* and may be quite mottled. Cases calling for this remedy are not characterized by the throat indications belonging to *Belladonna*.

Apis is indicated by rapid and extensive puffiness and swelling of the throat, the pain therein being of a sharp, stinging, lancinating character rather than of soreness. The face is pale and puffy, and symptoms of renal and vesical irritation set in early. Absence of thirst and aggravation from heat and after sleeping (*Lachesis*), are characteristics of *Apis* not to be overlooked. The *Apis* child will not allow the throat to be touched or examined, so sensitive is it to pain. Its cerebral symptoms, when present, are quite characteristic; while its sharp, piercing cry and rolling and tossing of the head on the pillow suggest *Helleborus*, and the incontinence of urine, vesical tenesmus and repeated scanty flow will at once suggest *Apis*. Its hours of greatest aggravation are in the afternoon, three to four p. m. or thereabouts (*Lycopodium* four to eight p. m.).

Antibac has a coryza all its own. It is exceedingly acrid and excoriating, burning wherever it touches. The nostrils are sore and cracked, as are also the corners of the mouth (*Arum*). The heat is intense and the bodily surface dry to parching. *Antibac*, though not often indicated, admirably suits those cases presenting excoriating discharges and intense fetor. It is rarely indicated except in very malignant cases, and more frequently in summer than winter. It shows an eruption of miliary rash in patches, dark and livid in color, which is irregular, disappearing on pressure and returning very slowly. In typhoid or malignant cases the eruption is of a bluish or purplish tint. In low, adynamic cases there are sudden and extreme prostration, torpor, vomiting, small, rapid pulse. The glands of the throat are swollen and sensitive to touch. When diphtheritic complications ensue, compare *Ammonium carbonicum* and *Apis*.

Ammonium carbonicum has stoppage of nose at night; child must breathe through the mouth; long-lasting coryza. The child's nose is stopped. It starts from sleep. Nose bleeds when washing face or hands. Tonsils swollen, bluish, covered with offensive mucus. Tendency to gangrenous ulceration of tonsils. Eruption of bright red, miliary rash. Is indicated when rash recedes too early and paralysis of brain threatens. Malignant cases with stupor, starting from sleep; putrid sore throat; saliva adhesive; swelling of parotid and cervical glands; stertorous breathing; excessive vomiting and involuntary stools. When diphtheritic complications ensue and the tendency is to gangrenous destruction *Ammonium carbonicum* is useful.

Carbolic acid has rendered me most excellent service in profound blood-poisoning types, with impending or confirmed coma, intense fetor oris, general besottedness of the countenance, patient difficult to arouse, otorrhea profuse and offensive, glandular involvement destructive. My attention was first called to the wide range of applicability of *Carbolic acid*, in the fourth aqueous dilution, by an article from the pen of the late Dr. James Kitchen, of Philadelphia, which appeared in one of the journals about ten years ago, since which time I have often found it a valuable helper. It corresponds to the putrid state of typhoid fever, the blood discolorization of yellow fever, etc. Its pathogenesis presents great prostration, unconsciousness; the heart seems almost to stop beating; disorganization of the blood; dark, almost black, and exceedingly offensive urine; face pale; mouth covered with false membrane; mucous membrane livid, corroded, exuding bloody mucus; throat red and covered with mucous exudation; skin livid, with general chilliness and coldness of the surface of the body. Surely here is presented a characteristic combination of very many symptoms of the adynamic state of scarlatina maligna.

Acute tryphtham is "an irritant poison producing inflammation and irritability of mucous surfaces, a low type of fever, especially of the eruptive variety" (T. F. Allen). It has among the symptoms calling for its use delirium; fluent coryza, discharge of thin, acid blood; salivation, tongue cracked, raw, burning; constant picking of the nose or lips until they bleed; association of throat and nose symptoms of diphtheria and scarlet fever, and, pathogenically, it has a rash not unlike scarlatina, followed by mild desquamation. *Acute* meets a class of cases between the *Ailanthus* type and the dry and inflammatory case of *Acute* or *Belladonna*.

Rhus *tox.* may be studied to advantage when the eruption is slow to appear or when it has been repelled by the patient getting wet or by sudden humidity of the atmosphere. Goodno, "Practice of Medicine," lauds it highly when the eruption is laggardly, the temperature high, with drowsiness, ulcerated throat, swollen glands, glazed tongue, restlessness and the general pain characterizing the case. He recommends it very low—in the second dilution. My practice is to give it in the higher potencies. It is one of the remedies whose acquaintance in the ascending scale improves with years. To me the *Rhus* case is the *Bryonia* case plus red tongue and much restlessness. *Bryonia* is better, too, in receding eruption, *Rhus* being more applicable to undeveloping rash.

Mercurius.—I do not like the mercurial preparations in scarlet fever. They are too prone to promote suppuration of the tonsils, sub-maxillary or parotid glands, or middle ear. I am inclined to the opinion, too, that suppurative nephritis may follow upon their administration, especially where the glomeruli are

already inflamed. Perhaps *Mercurius binoxidatus*, with its acute coryza, salivation, mucous inflammation, tonsillar involvement and glandular swellings may have a place in the treatment of this disease, and *Mercurius solubilis* may be a valuable remedy if the glandular and throat affections seem to call loudly for mercury.

Arsenicum album is a remedy of the first magnitude in adynamic cases. Putridity and prostration are its predominant states. The vital forces are severely waning. Anguish and restlessness provoke prostration. Aggravations, especially sinking of the vital energy, occur with exasperating regularity nearly every afternoon and soon after midnight. Emaciation, debility, exhaustion and diarrhoea, cold sweats and receding eruption call for *Arsenicum*. The pulse is weak and thready; hands and wrists inclined to be cool and clammy; breath putrid, tongue, lips and teeth covered with sordes. Scarlet fever cases calling for *Arsenicum* usually die, the symptoms indicating it being of the hippocratic or death-attending variety. And yet *Arsenicum* in medium or high attenuation, not too often repeated, may stop the downward course in an exceedingly critical moment.

Baptisia corresponds to fever of a low, typhoid type, with blood disorganization. There are mental cloudiness, putrid breath, sordes on teeth and lips early and general soreness of the muscular system. It reminds one somewhat of *Arnica* in this particular and in fact is a close analogue to that remedy in putrid fevers; but the soreness is on the side lain upon, not general as in *Arnica*. The tongue of *Baptisia* is yellowish-brown, or brown, with red tip and edges. The whole throat is sore and the corners of the mouth and lips are cracked; yet there is lacking the excoriation of *Arnica* and *Ailanthus*. The beetedness of the facial expression is more marked under *Baptisia* than *Gelsemium*, and the typhoid state depends not so much upon recession of the eruption as upon a disorganization of the blood plasma. Children of older years will experience and describe the *Baptisia* mentality and will want the supposed missing arm or leg found and restored to place. This "double somnium" of *Baptisia* is characteristic, when present, and even in children only needs interpretation, by reading between the lines, to be recognized. The offensive diarrhoea of intestinal complications will as often suggest *Baptisia* as *Arsenicum*. I formerly gave *Baptisia* in the lower attenuations but have later witnessed excellent results from the thirtieth and higher, even to the one thousandth, and am satisfied its general relegation to the low potencies is a mistake.

Terebinthina is a remedy of unquestioned value in the nephritic complication of scarlet fever, characterized by hematuria, strangury and inflammation. It is also an exceedingly useful agent in peritonitis and enteritis, which occasionally ensue upon recession of the rash. The abdominal walls are distended and

tympanic, or, in uncomplicated enteric inflammation the tympanitis is limited to the enteric coils. The tongue is dry, glazed, glistening. The fecal walls are also dry and red, and the pulse of turpentine is small, compressible, rapid and thready. There is intense heat, great thirst, exceeding restlessness, but the child fears to move because of enteric or peritoneal pain. *Terebinthina* presents a picture not altogether unlike that of *Asomile*, but its conditions are always secondary, *Asomile* always primary. *Terebinthina* is also a remedy of great usefulness in the hemorrhages of scarlet fever, whether from the nose, lungs, stomach, bowels or kidneys.

Arsenicum is among the most useful remedies of our materia medica in the nephritis of scarlet fever. It covers inflammation of the kidneys, with scanty or suppressed urine, burning, scalding micturition, droopy of face, feet and abdomen, and albuminuria. Its characteristic prostration and restlessness, with hours of aggravation, peculiar thirst and waxy and transparent skin will afford indications for its use.

Mercurius corrosivus is sometimes permissible in post-scarlatinal nephritis in spite of the tendency of all the mercuries to develop suppuration, because of its influence over the epithelial tubules of the kidney and bladder, and its supposed direct effect upon the albuminuric state. Its pathogenesis gives "diminished secretion of urine, with increased urging; urine saturated, cloudy, turbid, brown, mixed with blood; white sediment that looks like clouds of fluffs and shreds when stirred". Baehr says it corresponds to the course of uremia and has the power to cause convulsions, which come on late rather than early, as under *Belladonna*. The effect of sublimate poisoning upon the kidneys is very pronounced. They are enlarged, dark red and the cortical substance and pyramids can scarcely be distinguished one from the other.

Mercurius corrosivus suppresses the urine, and abscesses have been found post mortem in severe poisonings. Its vesical tenesmus is quite characteristic.

Phosphorus presents a remarkable picture of nephritis in its pathogenesis. The urine has been known to contain epithelial scales, pus, mucous corpuscles, blood corpuscles, excretion casts and albumen. In one case of *Phosphorus* poisoning reported by Nitsche in the *Wiener Wochensblatt*, in 1857, the kidneys were found to be "disorganized as in Bright's disease, the cortical substance not very glandular, the corpora and the rete malpighii considerably injected, the taloni uriniferi filled with excretion casts." The urine had also shown casts, and incipient pneumonia was on. In this picture will be recognized many of the conditions of post-scarlatinal nephritis, and it is only necessary that we have the physiognomy of *Phosphorus*, that is, its characteristic symptoms, in addition to the renal indications to fully justify its

exhibition. There should be the apathy, depression, dyspnea, debility and trembling, stupor, yellow, puffy face, and the vomiting of water as soon as it becomes warm in the stomach, a symptom quite often seen in nephritis, to warrant its use with confidence.

Lachesis corresponds to disorganization of the blood-plasma from the scarlet fever poison, and general putridity. The condition is most profound. The left side shows severest involvement, or the disease sets in on that side, and goes to the right, manifesting especially in the throat and glandular symptoms. The *Lachesis* patient is always worse upon waking from sleep; wakens startled, frightened, confused, afraid of suffocation and strangling. Besides this aggravation there is general aggravation of all the symptoms in the early part of the afternoon, from twelve to two. The weakness and exhaustion are more marked after sleep; that is, in the early morning hours.

Opium for the coma of profound infection; *Kalmia latifolia* for the cardiac and joint pains of rheumatoid complications; *Digitalis* for excessive heart beatings from exhaustion or kidney complication, or for the slow and labored heart beat of impending inhibitory paralysis; *Caenadis* for its characteristic symptoms as they relate especially to the kidneys and bladder; *Gelsemium* for cerebral excitement and kidney engorgement; *Hepar* and *Silicea* as respectively indicated by suppurating and indurated glands; *Phosphorus* and *Tartar emetic* in pneumonic complications, each always as called for by the totality of symptoms and conditions, with equal emphasis upon the two, will, in addition to the remedies elaborated upon, give the practitioner an armamentarium of most positive value.

Aconitum in the lower attenuations may be found helpful for general dropsical states, due more to cardiac weakness than to serious kidney lesion. But it is useful only as a palliative, or sewer-wash, sometimes called for when the effusion causes inconvenience and distress.

The tissue remedies will be found useful in scarlatina as homoeopathically indicated. *Ferrum phosphoricum* is recommended by Dr. W. A. Dewey as a "midway remedy" in febrile states, as lying between *Aconite* and *Gelsemium*. Naturally it will be thought of in the initial stage. *Kali phosphoricum* is useful in protracted cases, typhoidal in character, where putridity and exhaustion from long-continued nerve taxation threaten. *Calcarea sulphurica* has rendered me exceedingly satisfactory service in post-scarlatinal dropsy. In one case the effusion was general, the suppression of urine was so marked as almost to amount to anuria, and that which passed was heavily loaded with albumen, epithelial debris and some casts; yet *Calcarea sulphurica* set up prompt improvement and insured a good recovery.

Silicia is a king among remedies for glandular indurations, threatening suppuration, or prolonged otorrhea and glandular discharge. *Calcareo sulphurea* also acts nicely in some cases of otitis media in strumous subjects. I have always given these remedies in the sixth attenuations.

Pulsatilla may be called for and often renders valuable aid in catarrh, though if the pains be most violent *Magnesium phosphoricum* is called for. If from the otitic inflammation cerebral complications ensue, with sharp, piercing cries (*Apé*), and boring of the head in the pillow, or unceasing tossing from side to side, *Helleborus* may be needed. This remedy is also very appropriate to renal irritation, the urine being dark, scanty, even suppressed.

ADJUVANTS.—*Oxygen*. An adjuvant of unquestionable merit in scarlatina maligna is pure oxygen. I have had most excellent results from its free inhalation in numbers of putrid cases, one of them my own child. It aids in the elimination of carbonic acid gas, burns the debris to a finer ash, rendering it much easier of excretion by the breath, urine and bowels, as also by the skin when it is acting, very greatly and rapidly increasing the amount of urea thrown off, as shown by its presence in large quantities in the urine after the use of this agent. I have witnessed a reduction of two or three degrees in the temperature in an hour, an almost immediate steadying of the heart's action, with corresponding improvement of the pulse and respiration, and quick disappearance of coma and cyanosis. Even where profound stupor has been present I have observed prompt mental improvement from the forcible expulsion of oxygen from a retort directly in the patient's face for half an hour when the sensorium was too benumbed to admit of special efforts at inhalation. I look upon oxygen as a very valuable *aide-de-camp* in all states of coma and putrescence.

The protection of the skin, as touched upon in the beginning of this chapter, is of importance. This can best be done by the free and repeated application of any simple oleaginous substance, as neutral lard, unsalted butter, calendulated lard, olive oil, and the like. In country practice the free application of lard is much practiced, and thorough greasing of the whole body by tallow and has long been known to be useful.

I do not approve of bathing in scarlet fever. Where apparently absolutely imperative for purposes of cleanliness, or as an antipyretic, the hot bath, under proper precautions, is permissible. But when practiced, thorough anointing of the whole body had best be done immediately after the bath. *Cold baths in scarlet fever are absolutely dangerous*. It is true they may temporarily reduce the temperature and thus be apparently justified, but so often have I known rheumatism, endocarditis and nephritis to follow upon their use that I cannot bring myself to recommend them.

Goodno recommends cool baths, colder baths, cold baths, and even the dashing of cold water and the turning of the hose on patients in whom the temperature is high. But his remedial resources are so pronouncedly circumscribed, as outlined in his discussion of the treatment of scarlet fever, "Practice of Medicine", page 256 et seq., that I am led to believe his recommendation is in part a result of lack of proper effort in the direction of homeopathic medication. Cold water and cold packs in eruptive fevers are contrary to reason and sound judgment. Even though apparently unhygienic I prefer to trust the patient to oil frictions and subsequent thorough dryings with soft flannels for purposes of cleanliness for several weeks, especially if the throat and glandular symptoms and desquamation have been severe. And, above all, is this the proper course in my judgment in cases in whom rheumatic or kidney complications have occurred or are present.

Diet.—The scarlet fever patient requires nourishment. In all blood poisonings the system must be sustained as nearly at par as possible. In mild cases with slight throat involvement the ordinary daily food will be all that is required, and the appetite is not likely to be greatly disturbed. In severe cases with violent throat involvement mastication and deglutition are often exceedingly difficult, even almost impossible, and the proper support of the system becomes a matter of deep concern. Here solid food is out of the question, and even the swallowing of liquids is most difficult, these escaping at the corners of the mouth and from the nostrils through the patient's inability to properly close the mouth and the pharynx upon them.

Milk, or hot water and cream, being most natural foods for children, are great standbys. They should be given hot, as hot as can be borne, but not boiled, the latter being too constipating and more difficult of digestion. A favorite preparation with me is Mellin's Food, which is easily prepared, thoroughly nourishing, and which can always be obtained fresh and pure. I have never met with this article spoiled. Imperial Granum is another dietetic preparation of value, and is susceptible of being made into a variety of palatable dishes. Malted milk suits well in very young subjects. I am aware that a great deal of prejudice exists against proprietary foods, but, nevertheless, I have frequently seen most excellent results attend upon the use of those mentioned, and others as well. Bovinine given with milk is an agent of great value in older children. It also serves well as a rectal aliment when mastication and deglutition are seriously impaired. After cleansing the rectum thoroughly by enemas of clear tepid or warm water, enemata of bovine and milk, one teaspoonful to three of milk, every four to six hours, will long sustain life in a young child. Older children should have more. If the quantity proves too large and cannot be retained, smaller amounts may be

given oftener. Bovinine may be given per os also, in about the same proportions. Lean meat-broth made in an open vessel, never the beef-tea of the closed bottle method, with all the fat skimmed off, makes a palatable nourishment. Chicken-broth is not as nourishing as mutton or beef in fevers, and the fat is apt to cause gastric disturbances. In the use of beef or mutton extracts, however, their liability to do harm by over-stimulation and aggravation of nephritic conditions must be cautiously borne in mind.

Ventilation.—The scarlet fever room should be well ventilated, but never by direct draughts of air. If possible, ventilation should be had through an adjoining room. If this is not practicable a slight lowering of a window and a slight opening of it from below should be practiced, care being taken not to allow direct draughts of air to blow upon the patient. In humbler homes this can be avoided by hanging a blanket over a clothes-horse between the window and the bed, or by tacking it against the window facings. All sick rooms should have thoroughly good ventilation, especially the scarlet fever, diphtheria and typhoid rooms. Fresh air, even to moderate coolness of the room, is better than foul, heated air. But heated air is not necessarily foul, and if the happy combination of thorough ventilation and a temperature of about 70° F. can be maintained the patient will be the beneficiary. The burning of lamps in the sick room is always an abomination, and especially objectionable in diseases of the throat and respiratory tract. Preference should always be given to electric lights, next to candles, in city or country, and thirdly to gas. The coal oil lamp tells its own story of oxygen consumption out of proportion to flame, heat, offensive fumes, and carbon dioxide poisoning; and especially objectionable is the lamp with the light turned low.

Convalescence.—There is greater necessity for care in the convalescent stage of scarlet fever than in most diseases. The destruction of the epidermis renders the subject unusually susceptible to atmospheric conditions. If the exfoliation has been extensive it will be many weeks before it will be permissible for the patient to be out of doors in cold or damp weather, and in northern climes scarlet fever children sometimes have to be imprisoned for months at a time. Especially is this true where kidney complications have occurred, as also in those cases in which cardiac or pulmonary complications have attended the course of the fever, or where severe otitic inflammation and suppuration have added to the dangers. Rheumatic, kidney and meningeal complications may set in secondarily from too early exposure to inclemencies of the weather. The return to regular bathing should be long postponed, oil baths being given preference. The clothing should be warm, but unnecessary bundling up is not correspondingly pro-

tective not healthful. Candles and sweets of all kinds, rich pastries and "knick-knacks" and "notions" should be religiously eschewed.

The physician and parent will do well to exhibit the exercise of careful discriminative judgment in the convalescence of scarlet fever, managing each case on its merits according to the constitution and susceptibility of the patient, the seasons and the weather.

CHAPTER XVII.

DIPHTHERIA.

General Considerations—Endemicity and Epidemicity—Diphtheria in Animals—Age—Infectiousness—Predisposing Factors—Bacteriology—Symptoms and Course—The Mild Form—Malignant Diphtheritis—Nasal Invasion—The Kidneys—The Heart—The Skin—Structure of the Membrane—Diagnosis—Prophylaxis—Prognosis—Morbid Anatomy—Complications—Hygiene—Nourishment—Antitoxin.

General Considerations.—Diphtheria, or Diphtheritis, has been known to the medical profession for several centuries. Doubtless before the investigations and deductions of Bretonneau, in 1821, all kinds of malignant sore throat were classified under the same general heading; and even now the careless diagnostician calls many cases diphtheria which are nothing more than severe angina faucium, ulcerative sore throat, suppurative tonsillitis, etc. The discovery by Klebs and Loeffler of the specific bacillus which, while perhaps not the invariable cause of diphtheria is yet an invariable attendant upon it, has done very much to simplify and render certain the diagnosis of this most dreaded of all diseases of childhood. No matter what may be our views in relation to the germ theory of disease-causation we cannot fail to recognize the fact that certain diseases present certain micro-organisms, oftentimes possessed of the ability to reproduce themselves in proper culture media; and we are necessarily forced to the conclusion that there must be some specific relation between the disease and its attending bacillus. There is no longer a doubt that in true diphtheria the dumb-bell bacillus discovered by Loeffler in 1883 is the individual micro-organism associated therewith. It is "an immobile bacillus of irregular, bizarre form," and is found in the membrane, blood or internal organs of the patient saturated with diphtheria poison. It is claimed by some authors that it will grow also on the potato. It thrives vigorously in milk, and is exceedingly persistent, very tenacious of life and capable of revivification under proper circumstances months after its initial appearance.

It is, with its attending strepto- and staphylococci, among the most virulent of all disease-producing poisons. As a rule there is a direct correspondence between the virulence of the bacilli and the gravity of an individual case. This poison may be introduced into the human system by direct inoculation, through wounds, abrasions of the mucous membranes, diseased tonsils, and the like, or the disease may develop from causes quite unknown to us. The production of the pseudo-membrane in the throat or on any other site is purely a local or primary effect; and, as will be seen later, it is generally conceded that while the presence of the membrane may not necessarily imply very great danger to the patient, except where it invades the larynx and mechanically obstructs the breathing, it may by its presence and adherence to the mucous membranes interfere with the off-throwing of poisonous exudates whose subsequent decomposition and absorption result in further toxemia.

Endemicity and Epidemicity.—Diphtheria is endemic in most centres of population, the larger cities being rarely free from it. It is also epidemic at times, and nothing is more dreaded by the profession and laity than a malignant manifestation of an epidemic of diphtheritis. While it is urged by most authors that conditions of weather, soil, etc., do not have any very great influence upon the production of epidemics, the fact remains that these occur more especially in cold, raw, autumn weather or in the cold, damp, changeable weather of early spring, particularly after severe winters; and while we occasionally see outbursts in sections of cities otherwise accounted most healthy, yet it stands to reason and is a clinical fact that low sections of towns and cities possessed of heavy soil, defective drainage, bad sewerage, and generally unwholesome conditions suffer most severely from it. When it occurs in more healthy neighborhoods with better surroundings and improved sanitary conditions it may generally be depended upon that there is a local cause for its outbreak, as defective plumbing, with its attendant sewer-gas poisoning, a foul vault, a damp cellar with rotting potatoes or other vegetables, or some other unwholesomeness that has been overlooked. It may be very difficult in certain instances to trace the conditions favoring the development, but except in the presence of direct contagion or infection we should not fail to diligently search for the possible and probable causative factors and remove them.

Epidemics of diphtheria have been traced more than once to dairies, and in farming countries one of the most frequent causes of outbreaks of the disease is the unwholesome state in which the barn-yards, pig-styes, and premises are kept. The disease is, beyond question, communicable through the agency of infected milk; but whether this infection is from the cattle directly through milk, or from the unwholesome surroundings of the dairy, is not alto-

gether clear. Especially dangerous is the use of milk from dairy farms kept in an unsanitary state, and from dairymen in whose families diphtheria is prevalent. Necessary as milk seems to be to the human family it is one of the common carriers of infectious diseases, affording a most suitable media for the development of bacteria. Hence dairy farms and milk-supply depots should be placed strictly under the control of health departments; and in rural districts the family physician should make personal inspection of all the premises belonging to the family in which diphtheria occurs, and order the correction of existing evils.

Diphtheria in Animals.—In calves, cows, pigs, sheep and especially cats a false membrane is sometimes acquired, and profound constitutional symptoms develop therewith. Various bacilli are found at the seat of local inflammations, but it has not been proven that they are the Klebs-Loeffler bacillus of human estate. It has been clearly shown that the supposed diphtheria of fowls is not identical with that of human beings, and I believe further investigation will relieve most domestic animals of the indictment.

Children should not be allowed to sleep with pet cats or poodles, no more than should a child having a sore throat or the slightest degree of unexplained aphonia be made bed-fellow to a brother or sister of susceptible age. As stated, cats are subject to a pseudo-membranous disease very like if not identical with diphtheria, and children have been said to contract it from these animals and from pet poodles, with even fatal results. Diphtheria in calves and other animals is especially traceable to confinement in filthy barn yards.

Age.—Diphtheria attacks by preference young children. More than three times as many cases in a large given number are found to belong to children in the first five years of life than in any subsequent five years, more especially those from two to five years of age. Like scarlet fever the second half of the first decade affords the next largest number of subjects, but unlike scarlet fever the liability to diphtheria does not so completely cease with the oncoming of puberty. Adults of any age are subject to it, and it even occurs in very old people.

Infectiousness.—There is no disease from which physicians and nurses are more likely to suffer by virtue of association with their patients. Its infectiousness lies chiefly in the sputum, saliva and ejected throat secretions. The poison is not thought to be given off in the breath nor from the skin as in scarlet fever, and, therefore, it is especially necessary that those in attendance upon diphtheritic patients should, in examining and applying local treatments to the throat, avoid coming in contact with the secretions therefrom, ejected by the coughing, gagging and vomiting of the patient. Physicians have carried diphtheria to other patients and to their own families by being careless in this respect.

The poison of diphtheria is very tenacious, perhaps not so virile as that of scarlet fever, but yet possessed of sufficient vitality to be capable of infecting susceptible subjects weeks after its ejection upon the clothing, bedding, floors or walls of the sick-room. Hence the great necessity for pursuing assiduously the best methods known to hygiene for the disinfection of apartments occupied by diphtheritic subjects.

Diphtheria is inoculable and may appear upon any raw surface, as in mucous abrasions of the puerperium and upon wounded surfaces no matter where located. It has been the habit of surgeons performing tracheotomy in desperate cases to occasionally carefully cleanse the tube after its insertion in the trachea by sucking the secretion from it, or by removing the tube and blowing through it. In this way inoculation has resulted, and more than once the medical attendant has lost his life from this cause. While admitting the courage of the physician who thus strives to save his patient I cannot but hold this to be a most foolish procedure. So easy is it to cleanse the tube and the wound by a suction syringe, blow pipe, or piece of syringe tubing, or by other means, that he is indeed a foolhardy individual who places his life in danger in this manner. Surgeons and obstetricians should be as guarded about going from the diphtheria-room to other patients as is proper in scarlet fever.

Predisposing Factors.—There are certain predisposing factors which should be given emphasis in the consideration of diphtheria. Strumous children, those having enlarged glands, unhealthy tonsils, nasal catarrh, scorbutic conditions of the mouth, tuberculous history, afford most inviting fields for the development of the poison; and, conversely, healthy, robust children are most resistant to its invasion and less likely to succumb to its ravages. However, so vicious is the poison in its intensest malignancy that even whole families of strong, healthy children may be swept from existence in a single epidemic.

Bacteriology.—Since the discovery of the Klebs-Loeffler bacillus and its relation to diphtheria efforts have been directed toward experiments with cultures of this germ and with various medicaments that will have the effect of materially modifying the enormous mortality of diphtheria, which for centuries past has varied according to the intensity of the epidemic from forty-two or forty-three per cent to as high as seventy-five or eighty-five per cent. It has been estimated that animals may be rendered immune by treatment with peroxide of hydrogen, and also by inoculation with cultures of the bacillus which have been subjected to a high degree of heat, and by certain products of the bacillus itself obtained from the effusion from the pleural or peritoneal cavities of diphtheritic guinea-pigs, rabbits, etc.

The bacilli of diphtheria are thought to be incapable of producing *per se* serious pathological conditions. They thrive with

difficulty, if at all, on healthy mucous membrane, and seem to require the presence of other bacteria, streptococci and staphylococci, for their full activity unless directly introduced into the blood by inoculation. As suggested in speaking of the membrane and the exudation beneath it, it seems that the damage done by the bacilli of diphtheria is not direct but from the



FIG. 25.
STREPTOCOCCUS, 1000X.



FIG. 26.
PSEUDO-DIPHTHERIA BACILLI,
CULTURE, 1000X.

influence of a poisonous product, a ptomaine or tox-albumin. This may be separated from cultures of the bacillus by filtration through porcelain, and animals inoculated with it develop all the symptoms of the disease. Clinically the diphtheria bacilli are not always, nor usually, found in the blood of the patients nor in the tissues other than at points of infection.

At present health boards in large cities are establishing bacteriological laboratories for the purpose of assisting physicians in diagnosing diphtheria. Culture tubes charged with proper media, as preparations of gelatin, blood-serum, etc., are deposited at convenient depots, to be inoculated by the introduction into the media of some of the secretion from the throat, or other wounded surface, of a diphtheritic subject. The test-tube containing the media is then closed and kept at a temperature of 98.6° F. for about twenty-four hours. The bacillus being present there will develop small white granules along the track of the inoculation, which should be made by plunging a needle charged with the suspected secretion directly into the contents of the media in the long axis of the tube. The exudate from a non-diphtheritic throat will not develop the specific bacillus, while the exudate from the true diphtheritic throat will invariably show it within twenty-four hours. This bacillus is susceptible to destruction by boiling, so that bedding and clothing infected with it are readily disinfected by thorough laundering in boiling water. Its destruc-

tion is certainly guaranteed if boiled in bichloride solution, but this is not held to be absolutely necessary.

STAINING.—Roux's method of determining the presence of bacilli by staining is as follows: Swab the throat with a clean swab and smear a small quantity of the shreds on a glass slide. Pass it over a flame a few times quickly to dry and set it. Then make a solution, called solution "A" composed of:

Violet of Dahla.....	1 gramme.....
Alcohol.....	50 per cent, ten grammes.
Aqua dest.....	50 grammes.....

Make another called solution "B" composed of:

Methyl green.....	1 gramme.....
Alcohol.....	50 per cent, ten grammes.
Aqua dest.....	50 grammes.....

Mix one part of the solution "A" with two of solution "B" and pour two or three drops on the dry specimen. Leave it about a minute and then get rid of the excess of coloring matter by briskly shaking the slide in water. The "Roux Blue" acts especially upon the Loeffler bacillus, imparting to it a positive stain. Placing the plate on the *porte-objet* of the microscope the bacillus of Loeffler is readily discernible, somewhat thinner than the comma bacillus and somewhat enlarged at either end, dumb-bell like. The chief characteristic of these bacilli is that those approximating each other end to end never follow the same axis, but are arranged in circumflex accents, or parallel, or in rows.

CULTIVATION.—Roux adopts also another method, that of cultivation, wherein the *modus operandi* bases upon two tubes of coagulated serum and a platinum or iron needle flattened at the end, the serum being obtained from a carotid artery at a slaughter house, where it has been collected in closed vessels previously sterilized. It is allowed to stand twenty-four hours in a cool place, the serum occupying the upper portion of the vessels; the clear serum is then draw off by means of a pipette and placed in closed retorts over a flame. Putting the sterilized serum into test tubes, by means of a pipette, standing them on the incline in an oven at 80°, for the purpose of coagulation. A tube should be inoculated by a flattened needle charged, after sterilization, with particles of the membrane, or mucus if membrane is not present, obtained from the throat as far back as possible, tracing across the inclined surface of the coagulated serum in parallel lines, always drawn in the same direction. Proceeding in the same manner a second tube is inoculated without re-charging the spatula-needle. The tubes are placed in an oven at 98.6° F. for twenty-four hours. All this, recommended by Prof. Roux, in France, is now done, as stated, by health boards in larger cities of this country. If the serum be pure and the inoculation be carefully done certain diagnosis is assured. Colonies can be seen with the naked eye on the surface of the serum as grayish-white, rounded, regularly contoured, opaquely

centered clusters, if diphtheria be the disease. Sometimes the diphtheria bacteria can be seen as early as within fourteen or fifteen hours of exposure in the culture-oven. After twenty-four hours other bacteria form and render the diagnosis uncertain, the Loeffler bacilli being the earliest of all to respond to cultivation. Roux, Versin and Martin call attention to the "Brisou bacillus" as the only one likely to be confounded with Loeffler's. It is more succulent and when held to the light is translucent. It is also innocuous.

To render diagnosis as nearly absolutely certain as possible a tiny drop of water should be placed on the slide, and a colony of the bacilli placed therein by a hooked glass rod. This should be dried by being passed quickly through a flame two or three times. The dried colony is then treated with "Roux's Blue" and upon microscopical inspection the bacillus is seen in its typical form.

The Loeffler germ must be differentiated, for purposes of diagnosis, prognosis and anti-toxic treatment, from staphylococci streptococci and the Brisou cocci, all of which develop from the continued exposure of the serum to high temperature. The staphylococci produce on the serum flattened, irregular bacilli, meagrely developed in the twenty-four hours but developing rapidly after. They are round and gather in clusters. The streptococci develop in colonies of fragmentary dots interspersed among the larger diphtheritis colonies. Under the microscope they appear as small points joined two and two, or in short chains of from four to six links. The association of the Loeffler and Brisou bacilli indicates a mild case. But that of the Loeffler bacilli and streptococci or staphylococci are said to always indicate the graver forms of the disease.

Of 5,611 cases of suspected diphtheria examined bacteriologically under the auspices of the New York Board of Health from May 1, 1893, to May 1, 1894, 58 per cent were found to be true diphtheritis, 27 per cent were demonstrated to be false diphtheria, and in 15 per cent the diagnosis was left in doubt, either through faulty methods in the laboratory, defective media, carelessness in securing the specimen for cultivation, or because of the lateness of the stage of the disease in which it was taken. The Loeffler bacillus was found to be present in 58 per cent, while it was clearly absent in 27 per cent. Where present the mortality was above 27 per cent, these being cases of true diphtheria, while in the pseudo-disease it was but 2 per cent. This explains, doubtless, the wonderful success of physicians who "never lost a case of diphtheria." They have dealt with false instead of true diphtheritis, diseases so closely allied in their clinical history that only the microscope and culture-tube will differentially diagnose them.

Symptoms and Course.—The period of incubation of diphtheria varies from two to three days in cases of direct inoculation,

and from seven to twelve days where the disease is contracted in the ordinary way. In very mild cases the initial symptoms are lassitude, headache, slight febrile excitement, aching of the back and limbs, and in a fair share of cases slight manifestations of sore throat. Many a child not ill enough to go to bed may yet be ill with diphtheria and may later develop the formation of its characteristic membrane. On the other hand diphtheria may present with such slight local manifestations that they may be overlooked, and the diagnosis be not made perfectly clear until some of the post-diphtheritic processes show themselves.

In severe cases there is at the start profound prostration, severe aching of the back and limbs, and chill followed by acute febrile manifestations, the temperature rising to 103° or higher in the first twenty-four hours. In occasional cases if the children of the family are allowed to take care of themselves all the prodromic will be overlooked and attention will be attracted to the patient only upon the supervention of dyspnea or threatened asphyxiation. When the attention of the physician is early called to the throat there is slight redness of fauces and the child complains of some difficulty in swallowing. Usually the exudate first appears on the tonsils and it is not always easy to distinguish the diphtheria pellicle when it presents in patches or speckings from simple exudate from the tonsil crypts. Occasionally the membrane develops on the posterior wall of the fauces and even low down in the throat without the tonsils being involved, and when this is the case we are more apt to have the laryngeal or severest feature of the trouble. In very profound cases the objective symptoms present early, together with complaints of dryness, constriction and perhaps heat and soreness of the throat and difficulty in swallowing. Usually by the third day the membrane will have covered the tonsils and will show itself upon the pillars of the fauces, veil of the palate and even involve the post-nares. It is first white in color, changing to a dirty gray and later presenting a yellowish tinge. During the height of the disease it is closely adherent to the mucous membranes and if forcibly removed is likely to leave a bleeding and eroded surface, new membranes forming rapidly upon the bare surface when the exfoliation is not due to the convalescence of the patient. Strange as it may seem, even malignant cases of diphtheria are not attended by an unusually high temperature, 102° , 103° and $103\frac{1}{2}^{\circ}$, and rarely 104° , being typical. If the blood poisoning be profound and the case resolve itself into one of general septicæmia, as so often occurs from repeated infection from the absorption of toxins developed under the membrane, the temperature chart will present the characteristics of as typical a case of septicæmia as from almost any other blood-poisoning cause.

The Mild Form.—The usual course of mild cases of diphtheria is about as follows: After ailing for a day or two the child com-

plaints of sore throat, prostration characterizes its physical condition, the temperature elevates to 102° or 103° , the pulse corresponding in rapidity, 100 to 120; it is weak and irritable, there are headache and pains in the back and limbs and slight difficulty in swallowing. Examination of the throat reveals red tonsils with perhaps slight speckings of white or gray exudate, which by the third day is likely to cover the tonsils and faucial walls. The condition of the patient in a case of moderate severity is not that of a child profoundly ill, and by the fourth or fifth day of the disease this condition is really quite favorable. The pulse and temperature are not much above 100, the throat symptoms are of moderate severity only, and the constitutional depression is no more marked than on the first or second day. If there has been swelling of the neck and much difficulty of speech, with mucous secretion in the mouth, these symptoms subside, and at the end of a week, or ten days at most, the throat shows freedom from the membrane and convalescence permanently occurs. In this type of case the membrane begins to separate and is thrown off in flakes or shreds at from the fifth to ninth day. Unfortunately diphtheritis rarely presents so mild a course.

Malignant Diphtheritis.—Not even excepting small-pox in children is there a disease belonging to child-life more justly dreaded than a severe manifestation of diphtheria. The initial symptoms are not characterized by special intensity, as a rule, the malignancy presenting as the disease progresses. If, however, the poison is inoculated direct, as through a surgical wound or by being brought in direct contact with an abrasion of mucous membrane, the systemic infection may be almost immediate and a malignancy that will arouse deepest concern may show at the very onset. From twelve to forty-eight or seventy-two hours suffice to give a picture of profound infection. On the other hand, if the systemic invasion be not so great but be brought about by gradual absorption of the poison, by intoxication extending over a considerable period of time, the malignancy may creep upon the patient so insidiously that not until he has been ill for some days does the real character of his attack reveal itself.

When it blossoms out vigorously from direct inoculation the picture will be boldly prominent. The child, or adult, is seriously ill from the start. The prostration is profound, the pulse is rapid and feeble, except in cases where gradual heart paralysis ensues, in which event it will be slow, laborous, feeble, with increasing intermittency. The mental hebetude is marked, the eyes are dull and listless, and swelling of the glands and a generally edematous appearance of the face present early; there is ashy pallor of the countenance, or a dull, besotted, expressionless face. The temperature reveals nothing characteristic, except it is not usually elevated in correspondence with the severity of the symptoms. It

may even be above normal or below, an exceedingly dangerous hint, in cases characterized by severe toxæmia. If the saturation of the system be overwhelming death may ensue within two or three days from general paralysis resultant upon profound poisoning of the nervous centres. Or the case may drag itself out over a period of from ten days to two or even three weeks, to end in death from exhaustion or to terminate in protracted and complicated convalescence. Should systemic saturation be complete the constitutional condition may be so pronounced as to make the throat symptoms appear comparatively unimportant. Diphtheria kills from convulsions, or cerebral or heart paralysis without the presence of membrane in occasionally malignant blood-saturating cases. But these are so exceptional that the physician should ever be on the alert for throat manifestations, even though the sensorium be so benumbed as not to give warning of throat invasion. The stertorous breathing of impending cerebral paralysis should not be confounded with the labored efforts of laryngeal or tracheal obstruction. The one is the slow, sonorous, heaving breathing of commencing coma; the other the anxious, labored, mechanical breathing of gradual obstruction.

The exudation is commensurate with malignancy in a large proportion of severe cases of diphtheritis. We may not see it in the mouth and pharynx but it may occlude the larynx and trachea, or either, without presenting to vision. Here the breathing will be unusually labored and impending asphyxiation will mask evidences of suffering other than the distortion, cyanosis and distress incident to suffocative respiration. And if coma come on early, a most humane occurrence oftentimes, suffering may escape attention because of the inability of the patient to show pain; thus, the larynx may be practically occluded in this type of case, the ascending tracheal, without showing laryngeal distress of usual severity because of early coma.

But the rule is not in this direction. In correspondence with malignancy is the membranous exudation. Commencing with a whitish or grayish deposit on the tonsils and fauces it extends until the pharynx and even the buccal cavity are completely lined with a dirty-gray leathery membrane, from beneath and about which are emitted odors of exceeding foulness and penetration. The posterior nares are invaded and even the nostrils may be so occupied by the exudate, mucus and pus as to be partially or completely closed, breathing being carried on over sore, cracked, bleeding lips, and by the mouth, occupied by its leathery membrane and reeking with decomposing mucus, epithelial debris and foul ichorous pus containing Loeffler bacilli, streptococci, staphylococci, etc. The eyes become swollen and injected, the parotids stand out even with the face, the sub-maxillary glands are correspondingly swollen and indurated, otorrhea from one or both ears

may occur, and the whole picture be one of repulsiveness and distress. The mouth, throat and glands may even become gangrenous, the so-called black diphtheria, the fetor oris becoming intolerable and great masses of gangrenous sloughs being thrown off or necessitating removal.

Nasal invasion.—In young children examinations of the throat and posterior nares are exceedingly difficult, sometimes impossible. Especially difficult are rhinoscopic examinations, and the diagnosis of nasal invasion depends upon the ichorous and excreting discharges from the nostrils, the stuffy nasal breathing and the swollen and puffy appearance at the supra-nasal region. Because of the extreme vascularity of these tissues and the abundant lymph supply, and consequent plentiful opportunity for absorption of the poison, these naso-pharyngeal cases are likely to be attended with more extensive systemic invasion and local destruction than the laryngeal, the chief danger in the latter being from suffocation, as well as from the downward invasion of the trachea and bronchi. In these severe cases we may meet with persistent and even alarming hemorrhages from the nose and throat, due to destruction of capillaries and even small arterial or venous twigs. Herpes on the cheeks and chin, becoming ulcerated from the irritating discharges, glandular abscesses, especially of the parotids, corneal ulceration, destruction of the drum membrane and offensive otorrhea may one and all add to the distressing situation. The bronchi and lungs may be so invaded that pneumonia may terminate the case; or if it take on the ulcerative or gangrenous process alarming pulmonary hemorrhage may occur.

The Kidneys.—Kidney involvement is very often present, albuminuria being an almost constant attending symptom. Glomerular and tubular involvement are not so common as in scarlet fever, in fact, are rather rare. But these may be present and acute toxicemic nephritis with its attending phenomena, casts, albumen, urinary suppression, dropsy and hematuria may add to the gravity of the disorder. Joint complications, whether of rheumatic or suppurative character, are not nearly as common as in scarlet fever.

The Heart.—The heart complications are of a different type from those of scarlet fever. In the latter endocarditis is a not uncommon accompaniment, pericarditis showing in a fair share of cases; here the complication belongs more to the nervous system than to the serous membrane. While the action of the heart may be rapid throughout the course of the disease it often happens that it is quite irregular in beat or rhythm, or both. In fatal cases not due to long protraction the heart will often flag without appreciable cause, its beat gradually falling from one hundred and twenty or one hundred and ten to as low as forty or fifty per minute without apparent cause, death resulting from gradual instead of sudden

"heart failure." In other cases where the endocardium becomes involved in inflammatory process there will be aggravation of fever, as shown by pulse and temperature, precordial pain and distress, attacks of syncope and systolic murmur.

The Skin.—The skin eruptions of diphtheria have to be differentiated from that of scarlet fever in occasional cases, just as the throat conditions of the latter have to be differentiated from those of the former. In acute invasion there may be a fine rash closely resembling that of scarlet fever, but instead of progressing and intensifying with the developing case it lasts but a day or two and gradually fades away with little, if any, exfoliation of the epidermis. In more marked cases of diphtheria there are occasionally present purpuric spots, purpura hemorrhagica, as in pernicious intermittent fever of the congestio-febrile type, cerebro-spinal meningitis, etc. This "spotted fever" appearance is usually attendant upon the graver form of the disease, and accompanies coma, marked albuminuria, heart depression, sub-normal or exceeding high temperature. More rarely there will be met a case characterized by almost as positive integumentary involvement as in scarlet fever of the anginous variety. This is strictly a septic rash. Its oncoming is gradual, keeping pace with the intoxication and presenting pink or dark red blotches of considerable area, with sharply defined edges. As in scarlet fever, the color fades away under pressure, but quickly returns, the condition being less that of true integumentary inflammation. It usually is present where the skin is tight over bones, as at the ankles, knees, elbows, knuckles, etc., but becomes distributed in severe types, and general desquamation ensues. Unlike scarlet fever, however, this is not very deep and is soon over with. Furthermore, repetitions of the eruption as the disease progresses are of common occurrence, while this is not true of scarlet fever.

Structure of the Membrane.—The membrane of diphtheria is formed by exudation of fibrin from the vessels of the mucous membrane into the epithelial layer thereof. It consists of a fine network of epithelial structure, fibrin and leucocytes. The epithelium is soon destroyed and there is left a network of fibrin with leucocytes, blood corpuscles, streptococci and staphylococci, and mucous debris. In mild cases the membrane will be thrown off, ripening, as it were, in a few days. In malignant cases it seems to become deeply rooted in the throat membrane, and efforts to detach it are attended by pain and bleeding, a raw surface being left, affording a fine site for further direct inoculation. From a dirty gray the membrane becomes yellow, brownish or even almost black, from blood extravasation, as the disease progresses. It is sometimes removable in pieces of considerable size, is not dissolvable in water, remains firm in alcohol, and becomes swollen and spongy in acetic or citric acid. It is often loosened by the pres-

ence of serum and leucocytes beneath it, and is coughed or vomited off. In every instance it should be destroyed in quick lime chloride of lime, or burned, as also should all rags, sponges, swabs, etc., used in cleansing and otherwise treating the throat.

Diagnosis.—Diphtheria is often confounded with follicular tonsillitis, from which it is to be differentiated by the appearance of the exudate, in the latter there being a creamy-white exudation from the projecting mouths of the follicles, while in diphtheria the color is dirty-gray and the deposit is general and not limited to the projecting follicular openings. Later the exudate of tonsillitis may become more wide-spread, but it breaks off more easily and does not leave a raw bleeding surface as in diphtheritis. In tonsillitis the soft palate, pharynx and nares are not involved, and the disease presents a more acute history, more of pain, swelling, redness, fever and difficulty of swallowing; also more general aching and painfulness than diphtheria. The cervical glands are swollen in diphtheria, while they are not usually involved in tonsillitis. Albuminuria is an early symptom in diphtheria, an absent one in tonsillitis. Of course if the culture-tube and microscope are called into requisition the diagnosis need rarely if ever be confounded.

From acute pharyngitis diphtheria will easily be differentiated by the absence of profound or even moderately severe constitutional prodroma in the former, and by the absence of membrane. The differences between diphtheria and scarlet fever are marked, and differentiation is not usually difficult. The more gradual onset of diphtheria, the profound prostration, the slower pulse, absence of vomiting, and the later and less permanent and different character and location of eruption will usually suffice to diagnose it.

It is held that occasional cases of diphtheria and scarlet fever of a mixed type are met with, that the two diseases prevail in the same subject at the same time. I have never met with such a case. If combined, the extremely rapid pulse, strawberry tongue, characteristic eruption and more acute invasion of scarlet fever will be attended by the dirty-gray membrane of diphtheria, and, of course, the Klebs-Loeffler bacillus. But I lean to the opinion that these cases are diphtheria, pure and simple, with the toxic symptoms due to systemic response to the action of strepto- and staphylococci developed under the diphtheritic membrane. Scarlet fever may follow diphtheria in quick succession, and *vice versa*, but I seriously doubt that the two diseases can exist and develop at the same time, even though there seems to be apparently good testimony to such effect. And when scarlatina develops immediately after the attack of diphtheria it is my conviction that it is due to the unhealthy condition of the tonsils and adjacent tissues left by the diphtheritis, and the consequent absorption and toxemia of the streptococcus pyogenes. The announcement of the presence

of both diseases at once is looked upon by the author as implying a lack of careful differentiating analysis.

From membranous croup, an exceedingly rare affection, the insidious ascending laryngeal form of diphtheritis cannot positively be diagnosed except by means of the culture tube and microscope, or by the subsequent development of the cases, in which event, the specific (diphtheritic) character of the suspicious case will have been demonstrated, croup being neither contagious nor infectious. The onset of both are gradual, the impeded respiration creeping on without attracting attention until it suddenly develops to a most alarming picture of dyspnea and impending asphyxiation. The announcement of true croup in adults simply means diphtheritis, non-specific membranous laryngitis being a disease of early child life only. Croup is not attended by albuminuria, at least to marked degree, nor is paralysis or endocarditis a complication. Nearly all authors now treat of laryngeal diphtheria and true laryngeal croup as synonymous conditions. The presence of the Loeffler bacillus and the demonstration of the infectiousness of the disease will always prove it to be diphtheria and not croup.

Prophylaxis.—Diphtheria subjects should invariably be isolated. There is no safe exception to the rule. Other children must be kept away, and if a case occurs in a family of children, the well ones should not be allowed to attend school or any public gathering, or mix with their playfellows. The sick child cannot be given its liberty with other children with safety to them for forty days and it should be kept from school for like period (Whittaker). All furniture and utensils in, and the walls and floor and ceiling of, the sick room should be thoroughly disinfected by being treated to a two per cent. carbolic, or a one to one thousand mercuric bichloride, solution, and all bedding and clothing used in the illness should be destroyed or thoroughly boiled in chemicalized water, and afterwards in plain water. Sulphur fumigations are of doubtful value, and should never be wholly relied upon. When practiced, saltpetre should be added and the smoking of the sick room should be most thorough.

Prophylaxis by antitoxine is still an open question, but seems to promise well, according to journalistic reports. We can see no harm in using *Belladonna*, *Kali permanganum*, *Carbolic acid* or other remedy in proper attenuation in exposed children, but it would be all but criminal to rely upon any prophylactic medical treatment known at the present time to the exclusion of isolation and the use of other means mentioned previously.

Especial attention should be paid to permanent plumbing. This is often found to be faulty, and the disease may have been caused by the invasion of school, home or living apartments by sewer-gas laden with disease-producing organisms generated in

sewers, or introduced therein by the carelessness, all but criminal carelessness, of people who have made the water-closet the receptacle for the excretions and eliminations of diphtheria patients. There can be no doubt that in large cities this and other diseases are ever kept alive in this way. Indoor plumbing should be faultless. During the presence of diphtheria especial attention should be paid to the disinfection of wash-basins, sinks, toilet bowls and drain pipes. No excrementitious matter should be emptied into sewers until it has been treated to thorough chemicalization. Chloride of lime, Platt's chlorides, strong solutions of bi-chloride of mercury or carbolic acid should accompany all discharges down the toilet. In country districts and towns they should be treated to quick lime or be buried in wood ashes. Kitchen sinks should be freely cleansed and quantities of scalding water should be allowed to run through their pipes for hours at a time, if need be, in order to cleanse them from the grease accumulations of months or years.

Personal prophylaxis among nurses and attendants will consist in the careful conservation of all of nature's functions, daily exercise in the fresh air, frequent change of clothing, and nourishing diet. The use of stimulants as a possible preventive is a delusion. Not only so, but the depression they cause tends to invite infection.

Hygiene of the mouth and throat is always advisable. If the teeth, gums or mucous membranes are in an unhealthy condition, rinsing with a one to two hundred aqueous carbolic solution two or three times a day should be practiced. Abrasions of the skin, open sores and small wounds should be collodion-covered to avoid infection. Children who may have been exposed should be kept under strict surveillance, and their throats, especially their tonsils, should receive the immediate attention of a physician. Proper hygienic and medical treatment of a sore throat or sore mouth will often save from diphtheritic infection.

Prognosis.—Diphtheria is an exceedingly fatal disease. Its mortality reaches in some epidemics as high as eighty and even ninety per cent, in milder ones from twenty-eight to fifty per cent. Entire communities of children are often destroyed by it. In hospital practice it is especially severe and fatal, and in country neighborhoods also it may often destroy nearly every child attacked. No disease of childhood or adult life is more justly dreaded. Death very often ensues suddenly from heart failure, or the gradual paralysis of the inhibitory cardiac may terminate the case fatally. General sepsis destroys life in many cases, and diphtheritic laryngitis is nearly always fatal except when averted by successful intubation or tracheotomy. Sepsis depends more upon absorption of toxins than from original infection, and its degree of danger is not, therefore, to be determined by the amount of membrane, but, rather, by the severity of the constitutional symptoms. Feeble or slow pulse and low temperatures, with pro-

found invasion; extensive suppuration from throat and glands of neck; gangrenous conditions of the mouth and fauces, and the nasal types of the disease are all of grave import. Profound or protracted kidney involvement is dangerous. Convulsions or early paralysis are always alarming. The prognosis should in every case be guarded, and it should be remembered that until convalescence is complete there is danger of fatal paralytic or other complications in severe cases.

The prognosis in nasal cases will be influenced by the danger of extensive lymphatic involvement and consequent systemic invasion. Laryngeal cases are especially dangerous, first because of the liability to complete stenosis, and secondly, because of the greater liability to bronchial and lung invasion. The more extensive and adherent the membrane the more unfavorable the prognosis, because of the increased danger of repeated re-infection from sub-membranous tox-albumen absorption. Diphtheritic paralysis is especially dangerous when it affects the heart or throat muscles, and brady-cardia is always just cause for a guarded prognosis.

Vomiting, prostration, pallor, coma, hemorrhages, hemorrhagic oozings over extensive areas resisting relief-measures, cadaveric fetor, purpura hemorrhagica, intense restlessness, delirium, even though mild, irregularity and abnormality of pulse in rate and rhythm, and, especially, a very high or a marked low temperature are unfavorable prognostic indications. In kidney complications the degree of albuminuria and its persistence and the continued presence of casts in quantity will determine the prognosis.

Morbid Anatomy.—The chief anatomical change occurring in diphtheria, as may easily be imagined, lies in the "membrane." Usually commencing as a spot on one or both tonsils, it spreads in severe cases to all the adjacent tissues. The pharynx, cheeks, gums, posterior nares, nostrils, larynx, trachea, bronchi, esophagus, and even the stomach, biliary ducts and intestines may have the membrane developed upon their mucous lining. The neighboring lymphatic glands are also invaded from the throat. The glandular enlargement is often enormous, distorting the features in marked degree.

This membrane is made up, as stated, of fibrin exudate, epithelium, pus and blood cells and various micro-organisms. It dips deep down into the tissues and is nearly coalesced with the mucous structure upon which it grows. Necrosis of the tissue in greater or less area occurs under the false membrane and thus the latter is loosened; or protective layers of new cells are thrown out and the membrane thus loosened, curling up and being thrown off in five or six days in recoverable cases. When but a film this may take place a day or two earlier, but when the membrane is an eighth, a sixth, or a quarter of an inch thick, as it often is, it will require a longer period, sometimes eight, ten or even twelve days.

In malignant cases the blood undergoes considerable structural change. The glandular organs show parenchymatous degeneration in proportion to the severity of the attack, the liver and spleen showing enlargement and tenderness, upon even slight pressure. In especial instances jaundice is present, and while torpor of the bowels is the usual state diarrhoea will supervene if hepatic degeneration occurs to considerable degree.

Bronchitis is often present as a complication and during convalescence, presenting the usual pathological anatomy. Lobular pneumonia is also a not infrequent accompaniment; when severe it destroys life suddenly in cases doing apparently very well. In protracted cases the heart muscle is feeble and dilated and may even show signs of fatty degeneration. Its changes of tissues are due, of course, to faulty nutrition and enervation. In suddenly fatal cases thrombi may occupy its cavities.

Finally, gangrenous necrosis may involve the cheeks, fauces, adjacent glandular structures, and even the pharynx and larynx in the typical black diphtheria of unusually severe epidemics.

Complications and Sequelæ.—By far the most frequently threatened complication, to the superficial observer, is nephritis, for albumen is present in the urine early and late in diphtheria, and generally in direct relation to the type of the case. Epithelial and granular casts are also found in severe cases. And yet nephritis is a rare complication, albeit usually a dangerous one when it does occur, especially if coming on late in the more dangerous types of the disease. Dropsy is not often present, as in scarlet fever, even when positive renal degeneration occurs, diphtheritic dropsy being rare. The nephritis of diphtheria is less amenable to treatment than that of scarlet fever, and is more apt to become chronic and to be attended by secondary cardiac changes with eventual general dropsy.

Paralysis is a common and dangerous attendant upon severe diphtheritis, and is the most common sequel. It has already been stated that the heart suffers acutely and fatally therefrom. This may happen in the full blossom of any given case, or it may occur when convalescence seems to be quite well established. In many cases the heart will act badly during the whole course of the disease. Its rhythm will be disturbed and its beatings rapid, irregular and feeble, or the reverse, slow and thumping in character. The rapid pulse should be studied closely, not so much with reference to rate as to quality. The short and sharp though feeble stroke of approaching cardiac asthenia should be looked for. The systole is short and the second sound follows so closely as to seem almost to be a part of the first sound. Especially sluggish and flagging is the pulse in cases characterized by the profound systemic infection and overwhelming prostration from the commencement.

Mild cases with exceedingly rapid heart action are liable to sudden and altogether unexpected fatal termination from unusual exertion. Without warning, while at bed-play, at stool, especially if in sitting position, from coughing, from sneezing or other sudden muscular effort, syncope comes on more frequently in cases characterized throughout the course of the disease by rapid and feeble pulse, and during the faint a fatal inhibitory paralysis may supervene. In no disease, except, perhaps, yellow fever, is it so necessary to exercise special care during the earlier days of convalescence. Diphtheria children should not be allowed to amuse themselves with toys, etc., too early, nor should self-feeding or other personal exertion be allowed until a steady heart and well-toned condition of the nervous system have been secured.

The paralysis of diphtheria seems to depend upon ptomaine poisoning, and is usually peripheral rather than central. The laryngeal muscles or the vocal cords are often affected, a husky, aphonic voice being left, in some cases to last a life-time. In other subjects the muscles of deglutition will suffer through the impairment of their nerve supply, while, again, the speech may be thickened and indistinct from paralysis of branches of the lingual and labial nerves. Deafness, partial or complete, oftener results from paralysis than from eustachian stenosis or drum destruction and amchylosis. Strabismus of various forms may be a sequel, and ptosis and one-sided facial palsy are seen occasionally.

Pharyngeal paralysis is often a very annoying accompaniment of diphtheria, and because of the difficulty of swallowing incident thereto, liquids, as foods, drinks, medicines, will be regurgitated, much to the patient's discomfort. When deglutition is impossible for this reason food and medicine must be administered per rectum, or the latter hyperdermatically.

The extremities, chiefly the lower, are involved in about one-half the cases of diphtheritic paralysis. Numbness, tingling, formication and coldness of the skin and toes occurs, and the gait becomes gradually unsteady or "wabbling." Sometimes it is so unsteady as to amount to a positive staggering, or a leg will give away and the child fall to the floor. The knee jerk is always lost in these cases, and even in those in which the eye-lids, ocular muscles, ear, throat or other organs are involved; and it is also true that this tendon-reflex is absent in most cases of diphtheria, even where no positive paralytic symptoms are discoverable. Paralysis of the intercostal and pectoral muscles, of the diaphragm and of the accessory respiratories may cause no little disturbance of breath, as dyspnea, etc. Retarded oxygenation, irregular heart action and Chene-Stokes respiration may early ensue.

As Gower expresses it, "irregular waves of palsy seem to flow through the body." Paralysis of the throat muscles, absence of knee jerk and even fatal heart paralysis may occur without the

formation of the membrane at all, though usually paralysis is distinctly a post-diphtheritic condition. In some cases pathological changes may occur in the nerve cells and nerve roots, and permanent cord lesions be the result. The sphincter muscles are sometimes involved in the paralytic process, necessitating the use of enemata and a resort to catheterization for days at a time.

In paralysis resultant upon tox-albumin intoxication, usually the etiological factor in diphtheria, the symptoms are due to multiple neuritis, and recovery, under proper treatment, is the rule. Slight degrees of dysphagia, strabismus or deafness may be permanent, but even from these eventual complete recovery is the rule, permanent disability, even in slight degree, the exception.

Degenerative changes in the brain or spinal cord are, of course, more permanently injurious, and usually result, if extensive, in mental impairment or in muscular atrophy and consequent permanent physical decrepitude of individual members. Hemorrhages in the brain or cord as a rule clear up by absorption with complete subsidence of the symptoms arising therefrom.

Hygiene.—The diphtheria patient should be given a thoroughly comfortable single bed in a light and airy room, the ventilation of which can be made perfect by open fireplace or by free admission of air from an adjoining room or hall. A mattress is much better than a feather bed for obvious reasons, and the nursing and changing of the bed is much easier if a three-quarters bed is used than if the patient occupy a bed of full width.

Care should be exercised to admit fresh air every day, and if necessary several times a day, but the patient must be protected from direct draughts. Light rooms are always better for sick people than dark ones, yet the bed should be so situated that the patient shall not face the window. If necessary turn him in bed with his head to the foot. It is a mistake to darken the sick room, especially for children, unless photophobia and headache be present. No unnecessary furniture should be kept in the diphtheria room, and especially does this caution apply to upholstered furniture, curtains and carpets. Bare floors are preferable if close and clean, but cheap rugs may be used if necessary, and afterwards destroyed. If the sick room opens into other sleeping apartments the doors should be hung with sheets soaked in bromo-chloralum, Platt's chlorides or other disinfecting lotions, unless it be desirable to keep the room free of all these, in which event plain sheets frequently changed will do, perhaps quite as well.

It is always desirable to keep the temperature as even as possible, and for this purpose the thermometer should be employed and the mercury kept at 68° to 72° F. Radical variations in sick-room temperature are always dangerous in diphtheria.

If cleanliness were ever akin to godliness it is in the chamber of the invalid, and if desirable in any disease it is especially so in diphtheria. Excrementitious discharges should be disinfected and removed at once. The nasal, buccal and throat discharges should be cleansed away as often as possible, and cloths used for this purpose should be burned immediately. It will be found difficult to keep the diphtheria room pure and sweet under the most scrupulous attention that can be given it, and carelessness is sure to bear its reward in increased putridity and possible re-infection. Careful daily spongings of the patient are permissible, especially where the fever is considerable, but as quiet and rest are essential to his well-being, gentleness should characterize their application. In everything study the comfort and general good of the patient. Coercive measures are never justifiable, because of the danger of inhibitory paralysis.

Nourishment.—Diphtheria patients need nourishment. It is a debilitating, exhausting disease, and the system must be supported against its ravages. But how? Anorexia is a common condition, and even if it were not, it is most difficult to feed young subjects whose mouths and throats are sore and filled with putrid masses of pus, membrane and sloughs; whose lips are cracked, sore and bleeding; whose jaws are all but completely immobile from glandular enlargement and whose esophagi are perhaps almost occluded with leathery membrane. The question of support is a vital one, and because of the inability on the part of the patient to take food in sufficient quantities to sustain him it has been the habit for generations to resort to the free use of alcohol in some form. Its employment has been most general, and from the very onset of the disease. It has been argued that as diphtheria patients will tolerate larger quantities of whisky than sufferers from almost any other disease, alcohol is antidotal to the poison, as to the poison of serpents, and that, therefore, it is more than a stimulant, a remedy, in fact, of no small importance. Some authorities advise it in the form of dilute whisky every three hours, in varying but steadily increasing quantity, the pulse being the guide to dose and frequency of repetition. Others favor systematic saturation with raw liquors, while still others rely upon high wines exclusively. Alcohol is claimed to dilute the superficial blood vessels, thus relieving internal congestion, its action as a cardiac stimulant and tonic in toxic states being unequalled by any drug. It is also held that alcohol forms a direct food to the body tissues and that it thus aids in nourishing the system. It is further held that because of the disturbance of the glycogenic function of the liver by derangement of hepatic nerve-function the introduction of alcohol from without the system is necessary for the proper carbonification of the food taken per oram and per rectum, and for the perfect carbonification of the debris of meta-

bolism. Thus the reasons for resorting to the free administration of stimulants are multiplied until the testimony seems to strongly support the use of this agent.

But, nevertheless, I am opposed to their use, and for other than sentimental reasons. I have not found it useful in this or any other disease to any considerable degree; while, on the other hand, I feel convinced that their use encourages nephritic complications and sequelæ, and that it is responsible for many cases of neuritis, heart failure and paralytic states. Perhaps stimulants should not be tabooed altogether, but to rely upon them indiscriminately in a general way is empiricism of the worst sort, and calculated to result in a neglect to properly adjust nourishment and medicines to individual cases. Stimulants seem necessary in cases of threatened heart failure, especially those dragging along with slowing, irregular and feeble pulse, and it may be that alcohol in some form is the proper stimulant when one is needed; but I am strongly impressed with the conviction that hot milk, hot thin gruels, and other nourishments easily absorbed, will serve a better and more lasting purpose.

Food administered to diphtheritic subjects should be highly nourishing and easily digested, as support is needed and digestion is impaired. It is fortunate that milk affords such a perfect food for children, as solid food is usually out of the question. Hot milk is an ideal food in diphtheria. Milk should be procured fresh several times a day, never be allowed to stand in the sick room or adjoining rooms, and should be served hot, scalded but not boiled. If patients will not take it hot it may be given fresh from the cow, or cool if preferred. Buttermilk is also an excellent food article and is preferred for patients to whom sweet milk is constipating and, also, when there is much bodily heat. Koumyss is another milk preparation of undoubted value. It is to be had, unfortunately, only in cities, and few children like it. Rice and barley cooked to a paste and served with milk are nourishing and palatable when more solid food is possible; and the proprietary preparations, Mellin's Food, Imperial Granum, Peptogenic Milk, Malted Milk, Panopepton, and others, have their friends. I have found in Mellin's Food a really excellent article for very young diphtheria subjects. Blanc mango, sago, tapioca and oatmeal, served as thin gruel with milk or a little cream, are to be thought of, especially as convalescence approaches. Concentrated beef extracts are irritating and objectionable, but weak lean beef-broth made in an open vessel, or mutton broth made in the same way, and Borcine with milk, often serve a good turn, especially in children above three or four years of age. Beef-peptonoids also furnish an excellent food. Chicken broth is treacherous and apt to disturb the stomach and cause annoying intestinal flatus. Toast-coffee is permissible, and the juice of sweet oranges or grape fruit is allowable

when the condition of the mouth and throat will permit of their use. Grapes, the pulp only, are sometimes a grateful relish.

In critical cases food should be administered at regular intervals. Better anticipate exhaustion and guard against it than to have to meet it. Small quantities of milk or other selected food should be given every two hours to very young children, every three or four hours to older subjects. Frequent sips of hot water are also grateful and should be encouraged. Where good fresh milk cannot be obtained the Eagle or Anglo-Swiss brands of condensed milk may be found advantageous. They should be white and sweet, not yellow and rancid, and the can should never be opened or exposed in the sick room. Whipped egg and milk are nourishing and when sweetened a little will usually be partaken of with relief. If alcohol must be given it is better to administer it in the form of milk punch or egg-nog than as plain whisky. In desperate cases, where the mouth and throat are most detrimentally affected, rectal alimentation must be resorted to. And here milk and Bovinine, or milk and egg, with perhaps a trifle of liqueur, administered in quantities of from two to four ounces every three or four hours, will sustain life, if the bowel be kept clean and the nutritive enemata be administered with care and insistence. Fre general inunctions, twice or thrice daily, of pure olive or odorless cod liver oil (*Squalius*) will aid in supporting the system until feeding per os can be again possible.

Antitoxin.—The latest experiments in the line of antidotal treatment seem to have been productive of rather remarkable results, Behring and Aronson, of Berlin, and Roux, of Paris, being credited with having made discoveries which promise exceedingly favorably. With slight variations in their methods they have been the first to produce a pure culture of diphtheria bacilli, and it is held that the more virulent this is the better the results that follow. An extremely poisonous culture having been prepared it is injected into an animal selected for the experiment, very small doses being used at first, these being gradually increased until the most powerful poison can be resisted. It requires many months to obtain this immunity. The horse has been selected as being least likely to succumb to the experiments and as furnishing most of what is known as a serum-anti-toxine. When the animal has been shown to have developed a high degree of immunity its blood is extracted from the larger veins to as great an amount as can be spared with safety, and the serum is allowed to separate from the plasma. In this serum is contained the anti-toxine. There are certain processes essential to the success of the experiment which it is not necessary to detail in this connection. The strength of the solution obtained is expressed from the amount of serum required to save an animal of a given weight inoculated with a fixed poison. Thus, if it requires 0.001 c. c. of the serum

to neutralize the effects of poison in an animal weighing 300 grammes which has been inoculated with said poison, the strength of the serum is as one part of anti-toxine to 300,000 parts of body weight, that being described as a 1 to 3,000 anti-toxine solution. A small amount of trikresol is added to preserve the serum against decomposition and it is then ready for therapeutic purposes.

In appearance this preparation looks like diluted blood-serum, but the strong solution prepared by Aronson is said to have the appearance and consistence of dirty milk. This agent is introduced into the human system hyperdermatically. The age of the patient, the duration of the disease and the severity of the case are to be taken into consideration in determining the dose. The injections, if made under aseptic precautions, are said to cause no local inflammation, and it is said also that none of the systemic disturbances peculiar to vaccination or the injection of Koch's tuberculin follow its use. It is claimed that if this agent is used in the children of a family housing a diphtheria case, those having been exposed, but in whom the disease has not developed, can be rendered immune for from eight to thirteen days, and that by repeating the treatment occasionally this immunity can be prolonged over a period of months. It is also held that in this anti-toxine treatment complications are observed in very few cases, of these paralysis being perhaps the most frequent attendant, as it is, in fact, in diphtheria treated by other means.

Remarkable results are claimed for this new method in antidoting poison. Prof. Baginsky lays special stress on the fact that the new remedy has influenced the statistics so that the mortality in his treatment has fallen from 37 per cent to 13 per cent, and even to 11 per cent. Professor Roux, of L'Hopital des Enfants Malades, claims to have been able to reduce the mortality rate from 51.75 per cent to 24.33 per cent. These statistics are supported also by Versin, Martin and Chaillon of the same institution. During the period of time covered by the experiments of Roux and colleagues in L'Hopital des Enfants, in which the mortality rate was reduced from 51.75 per cent to 24.33 per cent under the serum treatment, the mortality from diphtheria at L'Hopital Trousseau in the same city was full 60 per cent. These figures show a gain of 27.42 per cent, and as compared with L'Hopital Trousseau of 35.67 per cent. In the United States in the Willard Hospital in New York even better results are claimed. In a recent contribution to the Medical Record Dr. White, resident physician thereto, in a very carefully prepared report of the treatment, deduces that in laryngeal cases the mortality is reduced from over 50 per cent to 28.5 per cent, and in all other cases it is reduced to 16.6 per cent. Prof. Johan Bokai, of the Buda-Pesth Stephanie Hospital for Children, reports the reduction of mortality in that institution to 14.335. Whether these remark-

ably satisfactory results will be secured by subsequent experimentations is yet to be seen; but the theory of blood immunization holds such close relationship to the fundamental law of Homeopathy, the practice of Pasteur in relation to anthrax hydrophobia and other diseases, and to the vaccination theories of Jenner, that it seems at this time to afford another link in the great chain of philosophical prophylaxis.

TREATMENT BY ANTI-TOXINE-SERUM.—M. Roux's technique of injection of the serum, according to *L'Art Medical*, is in detail as follows: He uses a syringe of twenty cubic centimeters' capacity, the body of the pump composed of glass and metal, the glass separated from the metal by two pads of caoutchouc. The spout is of caoutchouc, ten centimeters long, the needle four or five centimeters long. The syringe is to be sterilized in boiling water. After having filled the syringe, a fold of flesh is gathered on the flank and the needle is inserted from the base into this fold, care being exercised not to mutilate the cellular tissue when making this injection. The needle once in the syringe is changed to the other hand and with the right hand the piston is pushed in, directing it the while with a light rotary movement. After the injection the point of application should be bathed carefully with an antiseptic solution, but not massaged. A very little quantity of serum oozes from the puncture, and with protecting wadding forms a sort of colloidion. An edematous puff of considerable size appears during the injection and lasts some fifteen to thirty minutes. This should not be rubbed away.

It is claimed this serum can be used prophylactically by inoculating the well children with five cubic centimeters of serum when a case of diphtheria breaks out in a family. As to the therapeutic uses of anti-diphtheritic serum Roux's directions are about as follows: Any time that diphtheria is suspected the patient is inoculated immediately with twenty cubic centimeters. In patients of over fifteen years it is preferable to inject thirty or forty grammes, making use of two punctures, one on the right flank the other on the left. Having made a precautionary injection he charges the wire spatula and injects the two tubes of serum-media, whose examination determines the therapeutic indications. If there is no diphtheria bacilli the use of the anti-toxine is to be stopped. The examination of the culture-tube will show whether the supposed diphtheria be true or false. The indications of treatment for the serum depend upon four important elements: first the condition of the pulse; second, the temperature; third, the respiration; fourth, albumen. In general terms the favorable indications are, first, the involving of the pulse-curves in slightly elevated ascents, 38 per cent to 38.3 per cent; secondly, accentuations sharply elevated at first, then regularly descending (unfavorable indications are regularly ascending curves and upward curves in

the higher registrations of the sphygmograph); thirdly, curves oscillating in ascent to moderate registration.

The temperature furnishes some valuable data. It always increases when new ground has been attacked. When the diphtheria reaches the larynx the temperature rises; and when from the larynx it extends to the bronchial tubes and to the lungs it rises yet more. If, in angina, there is convalescence, with the temperature describing descending oscillations, and it rises abruptly to 102.5° F. in the morning and $103.8-5^{\circ}$ F. in the evening, it may be concluded that the malady is complicated or extending again.

Pure diphtheria anginas need generally from twenty to fifty cubic centimeters of the serum, repeated in three days, recovery being the rule. In cases where there is microbial association the cure is less certain and the serum doses must be greater. It should be understood that the serum treatment is not recommended to supersede all the local treatments, though Roux insists particularly on the suppression of phenic and sublimatic acids, because his experience has been that these substances do not advantageously associate with the serum. Boracic solutions find occasional favor, and so does a solution of Labarraque, fifty grammes to a litre in boiling water. Salicylic glycerine at 5 per cent. is also beneficial as a local treatment. It is perhaps well to suggest that the serum treatment in no way changes the alimentation of the children, which should be of quite substantial character, except when serious albuminuria makes an exclusive milk diet necessary. Behring's and Aronson's experiments, deductions and operations are on lines almost identical with those of Roux, Versin and Martin, and therefore, need no individual elaboration.

What permanent value this microbial theory with its cultivation of bacilli and anti-toxine treatment, as at present developed, may possess time alone can tell. Virchow credits the latter with much virtue. It may be held, perhaps, that their discussion is not in place in a work of this nature; but the author would consider himself directed should he fail to give reasonable consideration to generally acknowledged theories and possibly valuable antidotal treatments, no matter what their source. Certainly, the association of the Klebs-Loeffler bacillus and diphtheria is pronounced, even absolute; and if it be proven, as now seems established, that this germ and its toxine are the cause of diphtheria, it stands to reason that, the causative factor being recognized, antidotal treatment is simplified. Besides the homeopathic law of cure, there are also mechanical and chemical measures of relief and cure in numerous diseases. If the Klebs-Loeffler bacillus be fully maintained in causative relation to diphtheria it is not impossible that chemical or anti-toxine treatment may prove to be an exceedingly valuable hand-maid to homeopathy. At any rate, the scientific homeopathic physician should not be behind his colleagues of

other schools in striving to develop and establish all scientific treatments for malignant and destructive diseases, no matter what their origin.

CHAPTER XVIII.

TREATMENT OF DIPHTHERIA.

Local Treatment—Enlarged Glands—Abscesses—Otitis—Constitutional Treatment—Oxygen—Medication—Treatment of Diphtheritic Paralysis.

Local Treatment.—Great diversity of opinion exists as to the value of local treatment applied to the throat. Before the Chicago Academy of Medicine, two years ago, the late Prof. W. F. Knell held that diphtheria *per se* is purely a local process, and that the destruction of the membrane and local inflammation means cure for all curable cases. Following the Austrian school, he advocated the thorough application of crude carbolic acid directly to the diseased tissues (*Medical Century*, February, 1893). Dr. W. J. Martin (*Ibid.*, October 1, 1894) accounts the local use of hydrogen-dioxide of inestimable value. Jacobl, New York, in a paper read at the International Medical Congress at Rome, in April, 1894, denounces local measures as worse than useless. Goodno, "Practice of Medicine," cautions against harsh measures, but recommends permanganate of potash and peroxide of hydrogen for local use. He announces unsatisfactory experience with lactic acid, lime water, papain, trypsin and other agents used for the solution of the membrane. Whittaker, "Practice of Medicine," 1893, holds that it is obvious that "the true treatment of diphtheria must secure or attempt the eradication of the membrane which contains the germ of the disease," preferring above all other agents the sub-sulphate of iron applied by means of a cotton-wrapped sound which is immersed in an undiluted solution, being pressed against the neck of the bottle upon withdrawal to remove the excess of the fluid. He applies this direct under good light once or twice daily, according to the severity of the case. He also recommends plain steam atomizations as more effective than medicated sprays and gargles, and favors the peroxide of hydrogen per spray. Osler, "Practice of Medicine," 1892, urges local treatments, but cautions against harsh efforts at removal of the membrane. He advises spraying with carbolic acid, corrosive sublimate in the strength of two grains to the pint, chlorine water, boric acid, Condy's fluid, salicylic acid, fifty per cent solution of hydrogen-peroxide, and the swabbing of the tonsils with carbolic acid or perchloride of lime. Hale, "Practice of Medicine," 1894, advises alcohol with water or aqua eucalyptol, chlorinate of lime, permanganate of potash and

chloride of lime. Other applications and sprays are also advised. Niemeyer advises topical applications of nitrate of silver, concentrated muriatic acid and sesqui-chloride of iron. Bartholow says the objections to the use of caustic applications seem insurmountable, and that experience teaches that the morbid processes cannot be arrested by even the most prompt and efficient applications. Oertel, the modern Bretonneau, also discards and denounces all local measures, relying upon simple vapors and sprays for cleanliness. However, both Oertel and Bartholow spray the nares and fauces with weak medicated solutions. Dillon Brown, in the "American Text Book of the Diseases of Children," 1894, advocates local treatment as giving the best and most satisfactory results, advising the spray, atomizer and swab as necessary, in nasal-pharyngeal cases, resorting to the fountain syringe (why not try a hydrant?) and a pint of fluid at a time. Carbolic acid, oil of eucalyptus and turpentine form one of his combinations. Doekin admits that experience with local treatment has been unsatisfactory, but believes efforts in this direction should nevertheless be continued. He advises cleansing the throat with the swab saturated with chlorinated soda, one part to twenty, or Condy's fluid, one part to forty, this to be immediately followed by the direct application of the glycerine of carbolic solution. Ashby and Wright more conservatively remark, after naming a long list of local remedies that have been resorted to, that, "It is better to thoroughly use one of the milder applications than have a prolonged struggle, and perhaps in the end only partially succeed in applying the more caustic remedy."

Thus it will be seen that great confusion exists in the minds of authorities as to the efficiency of local treatments, the burden of testimony proclaiming their negative value. It will be readily comprehended that diphtheritis, occurring as a purely local affection, from the application of the disease product to an open wound or abraded surface, might well be treated by an escharotic, as in case of any other poisoned wound. And, therefore, the crude carbolic acid treatment seems to have the sanction of common sense in this type of cases. Certainly, were the author to meet very early with a case presenting a history of local infection of some external wound he would at once apply a strong escharotic. But who has met with a case thus early? When membranous formation has commenced it is no more sensible to attempt to cure the patient by burning off the membrane than to attempt the cure of a typhoid fever patient by burning the coating from his tongue. Primarily, a local affection in a fair share of cases, perhaps, diphtheria is a constitutional disorder in nearly every case, if not, indeed, in every instance, by the time the physician is called. To my mind the only possible advantage arising from a pursuit of local treatment lies in the cleanliness that may be secured by it, and in the gentle

removal of partially detached membrane beneath which there may be an accumulation of fetid pus, with its consequent danger of re-infection and further systemic disturbance. The use of peroxide of hydrogen as a pus detergent, in fifty per cent solution of the fifteen-volume strength, is permissible where it can be used without resistance on the part of the patient. The steam kettle of Siefert, which can be kept going constantly, possesses merit, and its use tends to keep the membrane soft and to render it more easily detached. Plain steam may be used, and is to be preferred, or Calendula, Hydrastis, Eucalyptus, or other favorite medicament may be added by those who wish to "do something." If the nostrils are very much stuffed and sore the steam vaporizer may be used quite directly, care being exercised not to scald the sufferer.

Whenever local measures of any nature are resorted to they should be used with the utmost gentleness and caution, lest harm instead of benefit result. And especially should it ever be borne in mind not to interfere with the constitutional treatment by antitoxin, or worse than antitoxin, external measures.

ENLARGED GLANDS.—Local treatment of glandular enlargements is useless. The application of iodine or other drug is absolutely valueless. Fomenting, if abscess be inevitable, may hasten suppuration, but it is a very unsurgical procedure and should find small favor. Comfort is sometimes given in case of unusual distension by the free use of pure olive oil or neutral lard over the swollen glands and adjacent tissues. The old fashioned application of thin pieces of fat bacon stitched to flannel possesses more merit than many new-fangled drug store combinations.

ANGREKES.—Must be treated on strictly surgical principles. Once established, their early and thorough evacuation should be practiced. If necessary, the integument at the point of invasion may be anesthetized by the application of cocaine or chloride of ethyl. The incision should be free, always in line with the grain of the integument, and the cleansing should be thorough. While desirable to avoid large incisions, because of their subsequent scars, yet these should be free enough to admit of thorough emptying and subsequent drainage. The employment of hydrogen peroxide in half strength is an aid to thorough cleansing and promotes early healing.

OTORRHEA.—Local measures here are of little avail except the discharge be long continued or recurring formation and periodic escape of pus become a feature. Here again hydrogen-peroxide, one-third strength, will serve a good turn and greatly simplify the cleansing of the auditory canal. A favorite local application for persistent otorrhea in the New York Otological Clinic is the application of calendulated sugar of milk.

Constitutional Treatment.—Doubtless one of the greatest errors the physician can fall into in the treatment of diphtheria

is that of allowing his attention to be too largely directed to the throat and its membrane. True, the throat is the local site of the disease, and the most distressful symptoms, as impeded respiration, difficult deglutition and impending suffocation, are associated therewith. But, after all, it is the patient who is ill and not the patient's throat, alone, nor chiefly. This thought cannot be too strongly impressed upon the mind of the student and beginner. Much of the mortality of diphtheria is due doubtless to the early neglect of the systemic picture in "getting after the throat." It should be borne in mind, always, that the throat symptoms, important though they are, are not the whole of the case, the totality never being found in the throat alone.

OXYGEN.—As in the sepsis of scarlet fever and other blood poisoning states so oxygen will frequently be found a valuable agent in the profound torpor and septicemia of diphtheria. Especially will it be indicated when the heart's action is irregular and weak, or where there is impending heart failure, sopor, even to coma, cyanosis and coldness of the extremities. And, again, it is a most useful remedy when there is great heat, flushed and besotted or very pale face, injected eyes, throbbing carotids and threatened convulsions, the blood being charged with carbonic acid and urea. Here the inhalation of nascent oxygen will be found most beneficial, and rapidly so. It serves to arterialize the blood, steady the heart's action, burn the non-eliminated debris to a finer ash, securing its rapid elimination by the breath, skin and kidneys. As in scarlet fever, I have witnessed an increase in urea of more than double the quantity, thrown off within a few hours from the inhalation of oxygen, and have seen the breathing improve, the heart become steadier and more regular, the cyanosis disappear and the whole aspect quickly change from one of coma and impending death to favorable condition. I look upon oxygen as one of the most valuable of all remedies in blood-poisoning states. Unfortunately, it is not to be had in country practice, unless ordered from city supply houses in cylinders by express. But in city practice it is always available, and even in towns and country points close to large cities it is easily obtained in a few hours.

Oxygen inhalations may be repeated as often as the symptoms and conditions enumerated may demand. Each administration should embrace a number of deep breathings of the gas direct from the inhaler. Should the patient be already unconscious, or in a stupor state, the inhaler may be held to his face and atmospheric air be excluded for a minute or two. A tube may even be inserted in one nostril and the gas be turned on gently, the other nostril and lips being closed during the administration. Its use should be persisted in faithfully for hours, and days if need be, at intervals of from half an hour to two, three or four hours, according

to conditions present, each seance lasting from a few minutes to half an hour, as the judgment of the physician may indicate.

The over-administration of oxygen in delicate subjects may cause headache. Nose-bleed following its use implies over-dosage or too long continuance of the seances. But it is not in any sense a dangerous agent and can be used with the utmost freedom, headache and epistaxis alone cautioning against excessive administration. Moreover, during its employment there need be no suspension of remedies or other measures usually employed in the ordinary conduct of diphtheria cases.

MEDICATION.—In a general way, remedies that are useful in all profound, constitutional, blood-poisoning states will do the best service in diphtheria, for no case gets through with purely local manifestations. *Arsenicum*, *Lachesis*, *Crotalus*, *Baptisia*, *Kali permanganatum*, *Lycopodium*, *Mercurius cyanuret*, *Mercurius iod. flavus*, *Carbo vegetabilis* and *Secale cornutum* are among the popular medicines called for in the more malignant cases. *Lac caninum* is also highly extolled, while *Belladonna*, *Phytolacca*, *Aper*, *Kali chloricum*, *Kali bichromicum*, *Arum triphyllum*, *Ananimum canadense*, *Bromium*, *Nitric acid*, *Sulphuric acid* and *Veratrum album* are also very useful. In fact, almost any among the wide range of remedies in the materia medica may be called for to meet some special feature in individual cases. If justly condemnable anywhere, the exhibition of routinism is especially so in diphtheria, as in all profound conditions requiring the application of care, judgment and a high order of medical skill.

Arsenicum will naturally be thought of in two special stages of diphtheria, the beginning and the ending. In the beginning, where languor, lassitude and great prostration usher in the case; where the child is dull, listless, apathetic, is "so tired," and anxiety, apprehension and on-coming distress are beginning to show; coolness of the general surface, with hot palms, restlessness, thirst, either for a little water often, very characteristic when present, or for large quantities not so often. Chilliness, intermingling with heat, creeping shiverings and profound fatigue, characterise this remedy. As will be seen, the condition is a systemic one and the throat is not mentioned. Or it may be spoken of indifferently, the prostration, anxiety and feebleness constituting the early arsenical symptoms.

Later, the great anxiety and restlessness, hippocratic countenance, enlargement of cervical glands, great fetor from the mouth and throat, dry looking and wrinkled appearance of the membrane, great weakness and prostration, ulcerated mouth and throat and watery and offensive diarrhea, call strongly for *Arsenicum*. Its symptoms are aggravated after midnight, and the patient is not as well in the early afternoon as in the forenoon and evening; is worse from cool air and cool drinks, and ameliorated by warmth and hot

drinks. The *Arsenicum* state is one of great putridity, great prostration, great degree of systemic infection.

The *Iodide of Arsenicum* has more glandular involvement, weak heart action, deposit extending to lips, covering fauces and mouth completely and extending even to the auditory canal. It presents a more profound adynamia than the *albus*, but not so much of the hippocratic state, and is especially useful in commencing pulmonary invasion. The breath is very foul and the glandular enlargement most marked and extensive, with extreme induration.

Lachesis is characterized by profound invasion and blood changes; "when constitutional symptoms predominate over local," (Dunham). With throat symptoms of slight intensity there is great prostration, slow, feeble pulse, cold, clammy skin and an exalted sensitiveness to pain, so that intense pain attends a small amount of inflammation. The breathing is so interfered with that respiration is most difficult, with great heart weakness and profuse perspiration. From the very commencement asthenia is present in a marked degree. The mouth and throat take on a livid hue, the tongue trembles and is protruded with difficulty, and liquids regurgitate through the nose from pharyngeal paralysis. The left side is usually more involved, not only in the paralytic symptoms, but in the ulcerative processes as well. Indicated in "black diphtheria"; oozings of dark, disorganized, blood and gangrenous conditions of the mouth, nose, throat or glands. *Lachesis*, when clearly indicated, is a friend in time of need, and will be found most helpful in the higher potencies.

Crotalus is closely akin to *Lachesis*, but there is more tendency to hemorrhage from mouth, nose, bowel or kidneys. Its hemorrhages are persistent rather than copious, blood oozing from the mucous membranes of mouth and nose constantly. The pulse is small, thready and rapid, prostration is profound, the fauces are swollen and dark red, and the difficulty in swallowing is very great. Because of the persistent oozing of blood the mouth looks black and repulsive, and it is impossible to keep it cleansed. As in yellow fever the *Crotalus* state is indicative of profound disorganization of the blood. If vomiting occurs it is quite like the black vomit of that fever, from oozing of disorganized blood through the gastric mucous membrane. Rattlesnake poison also causes a general lymphangitis and cellulitis, especially of the neck and trunk, and, therefore, is indicated when like condition is present in diphtheria. The neck, thorax, arms and hands swell and distend, sometimes enormously.

Baptisia corresponds to the typhoid state. It also has great prostration, but it presents a besotted expression, a relaxation of facial muscles that does not belong to *Arsenicum*, *Lachesis* or *Crotalus*. This relaxation extends to the faucial muscles, also, and as

a result there is a swelling and edema out of proportion to pain and inflammation in the early stage. Because of this edema there is constant tendency to swallow, but swallowing is difficult and soon becomes painful. The mental state of *Baptisia* is characteristic, the duality of consciousness being marked. Thinks there is more than one of him, or that there is some one else in bed with him. Is scattered about; a leg or an arm is gone, or the throat or chest is missing. If the symptom presents as if another person were in bed, it takes on the character of fright or annoyance usually, while it is to be interpreted as a symptom of worry or anxiety if the child is not old enough or not able to express it in words. The unrest due to this mental peculiarity is very wearing to the patient's nervous vitality.

Baptisia has delirium, confusion of sight and hearing, inability to properly express one's self, low, adynamic fever. Sometimes a temperature of 104° or 105° , with general lividity or dark redness of the trunk and face. There may be also a good deal of difficulty in breathing during the *Baptisia* besottedness, evidently from pulmonary stasis due to general nerve relaxation; breathing is oppressed, labored respiration, imperfect oxygenation, must have fresh air.

Kali permanganum has been highly lauded as a supposed disorganizer of the deposit of diphtheria, and has been used locally in weak solution and also constitutionally. The entire mouth and throat are covered with a black, foul exudate and the odor from the breath is intolerable. The throat is swollen inside and out, the face is purple, the eyes are injected and swollen, there is a thin, sanious, excoriating nasal discharge, and a *Lachena* difficulty of swallowing and regurgitation. Great putridity and prostration characterizes the *Kali permanganum* case, but in selecting it the local conditions are the key.

Mercurius cyanatus is called for in excessively putrid cases without much glandular invasion. The glands are tender and inflamed, but not greatly enlarged; or if swollen the cellular tissue of the neck is infiltrated, as with *Crotalus*. There is adynamic fever from the start, and profuse nosebleed and incessant flow of saliva. The membrane forms early and is of a dirty gray color and leathery in character, the nasal cavities, mouth, fauces and pharynx being covered by it. Like *Kali permanganum*, the local symptoms are most characteristic. But frequent fainting from heart weakness, sweatings upon slight exertion, with aversion to food and weak, filiform pulse, and general weakness, also call for this remedy, especially when its local symptoms are prominently present.

Mercurius solutus flavus has yellow membrane, worse on right side, and a constant accumulation of mucus in the mouth and throat, causing continued and annoying efforts at clearing the phlegm away. It is not the salivation of the *cyano*, but a thick,

tenacious mucus, difficult of dislodgment. Tongue yellow, with tip and edges red. The pharynx and tonsils present little yellowish specks, dotted here and there. The membrane is limited in area, chiefly on right side, translucent, albuminous, and easily detached. Patient craves acid drinks, neck infiltrated, aggravations at night, urine scant and highly-colored.

Mercurius iodatus ruber is not nearly so useful in diphtheria as in tonsillitis, has membrane worse on the left side, especially on the tonsils, and the throat looks livid in spots. Doesn't crave acids, as with the *protoiodide*, but likes well-salted food instead. Tonsils are swollen out of proportion to the amount of exudation present.

Scalé is not down in the books as a remedy of special value in diphtheria, but I have found it useful in cases characterized by emaciation and atrophy, dry, wrinkled, withered skin, and great putridity and prostration (*Arsenicum*, *Lachesis*, *Kali permanganum*) with hemorrhage of dark, thin, disorganized blood (*Crotalus*, *Lachesis*) from mouth, nose and bowels. Wants to be fanned all the time. Pulse weak and thready. Whole child smells cadaverous; involuntary diarrhea of cadaverous, thin, dark, even black stools; stools tarry from intestinal oozing. Mouth and throat putrid, and exudate dry and shriveled. Or, offensive, sanious secretion underneath membrane and in posterior nares and nostrils.

Silanthus is frequently indicated in diphtheria attended with extreme prostration, in cases occurring in summer, or in those complicated with scarlatinal symptoms. There is great debility and prostration from the outset, countenance indicates distress and anxiety. The throat is livid, swollen, dark red, almost purple. The tonsils are swollen and studded with patches or deep ulcers oozing a fetid discharge. The cervical glands are swollen and sensitive to touch and there is a greenish purulent discharge from the throat.

Carbo vegetabilis corresponds to low types of the disease, with hemorrhage of dark blood persisting for days until exhaustion and anemia are marked. Breath cold, face, limbs, and feet cold and clammy. Sepsis profound and collapse threatening. Pulse weak, intermittent, thready. Death apparently immediate. While not very often "at the brink of death a savior," yet *Carbo vegetabilis* in very high potency will sometimes rouse the dormant life-force and induce reaction.

The *Apis mellifica* patient is despondent, discouraged, lachrymose. The pains are burning, stinging, sore, occur in sudden paroxysms, migrating from one part to another. The patient awakens from sleep anxious and agitated and is very sensitive to touch. A hot room is intolerable. The mouth and throat are dry, yet the patient is without thirst. Pain when swallowing is not emphatic, though the throat may be greatly swollen. The patient is marked by great debility from beginning. The mouth, throat and pharynx are bright red as if varnished (*Lac caninum*). The membrane is

dirty gray, tough, the uvula is edematous, as if filled with water (*Kali bichromicum*, *Rhus*). The tonsils have deep moors, are edematous and have erysipelatous surroundings. The attack is insidious, adynamic, with great prostration and debility, the exhaustion overshadowing the local symptoms of the throat. It must not be given before or after *Rhus*. *Apis* is homeopathic to extensive swelling of the cellular tissues of the throat and adjacent glands. Mucous membrane very much swollen, and pillars of fauces very edematous. Intense and extensive inflammation of the throat without much pain. There is not much fever and the pulse is strong and full, but the high degree of inflammation of the throat, with its bright redness and extensive edema, together with the extension of pricking pain and lacerations, if pain be present at all, to the ears and parotid glands, give warning of the serious condition of the throat to follow. Like *Kali permanganas* and *Mercurius cyanatus*, *Apis* will be chiefly indicated by local symptoms. There is no thirst, or not much thirst, and scanty, high colored, and burning urine is voided drop by drop, or a little at a time, with vesical tenesmus. Anuria, or retention, in some cases mistaken for anuria, because of the small amount secreted, may also call for *Apis*. The high grade of faucial inflammation, marked edema of the throat and total or almost total absence of thirst, are striking symptoms of *Apis* in diphtheria. In very young children with brain symptoms, "hydrocephaloid," characterized by sharp, shrill, piercing screams, rolling of head from side to side, or boring it back into the pillows (*Hellebomus*), this remedy will serve us well. *Apis* is quoted by Lilienthal as having tendency to heart failure in diphtheria, and as being called for in diphtheritic croup, with rough, hoarse voice and sensation of rapid edematous swelling of the lining membrane of the air-passages.

Belladonna, so useful in the congestive and mild inflammatory types of sore throat, is not possessed of much value in diphtheria. In mild types, with great dryness and constriction and dark redness of the upper part of the throat, the right side being chiefly affected, the patient presenting headache, throbbing in character, hot, dry skin, much thirst, with great difficulty of swallowing because of the pain, which brings tears to the eyes, *Belladonna* may be found useful. Also, when cerebral symptoms present themselves early, and convulsions threaten or are already on, it may be one of our best remedies. But it is more suited to the congestive or early inflammatory stage, as a rule, and its symptoms will not often be present after the membrane begins to form.

What has just been said of *Belladonna* applies with equal force to *Aconitum*, whose indications need not here be recounted. Possibly of use in the first few hours or day, in a highly inflammatory and intensely nervous type of cases, it will not be longer indicated in diphtheria.

Even where high fever ushers in the disease *Baptisia*, *Gelsemium* or *Veratrum viride* are more likely to be indicated than *Aconitum* or *Belladonna*.

Phytolacca has been much landed in severe throat ulcerations, but it has been disappointing to me. For pains in back of head, and contracting pains in the muscles of the legs and hamstrings, with "sensation as if the throat were a great hollow cavern," if in fact, such a sensation ever occurs, this remedy may be found useful.

Rhus tox corresponds to the typhoid state in diphtheria, and presents its peculiar tongue, with red, dry, triangular tip, base forward, with papillae sore and inflamed, lips and teeth covered with sordes, mottled eruption about joints, chest and abdomen, intense restlessness, bloody saliva oozing from the mouth, whose corners are raw, cracked and bleeding. The *Rhus* child wants to be carried or changed from place to place, and its symptoms are all aggravated as nightfall approaches. In typhoid states there is also low, muttering delirium, hot, shriveled skin, and transparent, jelly-like diarrhea.

Lycopodium is a remedy of no mean value in cases to which it is the simillimum, despite the fact that with many its use is limited to atonic dyspepsia. It is especially indicated where the diphtheritic process begins on the right side of the throat, and in the right nostril, extending to the left. The patient drinks warm drinks greedily because of the relief they give to the throat. There is a thick yellow discharge from the nose, and the nostrils are so stuffed as to make breathing through them difficult or even impossible. The face has a silly, bloated look. There is stupor and dropping of the jaw, and paralysis threatens. The breathing is labored, rapid, snoring or rattling in character, and unconsciousness soon follows upon the mental hebetude. The urine is scant and scalding and deposits the uric acid crystals denominated the *Lycopodium* "red sand."

Kali chloratum has been much abused by the old school in mouth and throat diseases. It has a limited sphere of usefulness in diphtheria. Numerous small gray ulcers are studded over the buccal and faucial membranes, and there is excessive secretion of tough stringy mucus. The throat is dry and sore and the voice is husky and hoarse. Incessant cough, difficult respiration, oppression of the chest, whitish or milk-white sputum, and watery frothing from the mouth complete its indications.

Kali bichromicum presents a much more complete diphtheritic picture: diphtheritic deposits in nose, pharynx, larynx, vulva and vagina; the membrane is greenish-gray, brownish-yellow, like wash leather (Lilleenthal); swelling of tonsils, uvula, tongue, cheeks, gums and lips, all smelling like decaying meat. Deposit extends upward into nose and downward into larynx and trachea. In the laryngeal form there is sharp, shrill, whistling respiration. Harsh,

croupy cough. Lungs oppressed; breathing very much impeded. Exudation tough and very adherent. Deep ulcers in the fauces, and throat purple, with mucous patches of greenish-yellow exudate. Difficulty in swallowing, and pains extending to the ears when swallowing. Long strings of tenacious mucus from mouth, and nasal discharge yellow and excoriating.

Carbolic acid.—Low adynamic fever with marked absence of pain. Membrane loose and easily detached. Great accumulation of loose, swollen exudate, pus and debris, emitting a fetid odor. Later, excessive prostration with violent fever, headache, dizziness, nausea and weak, thready pulse. *Carbolic acid* classes with *Lachesis*, *Crotalus* and *Aspidoceras* in the septicoemia of diphtheria.

Araa trypheflum corresponds to mixed infection; that is, to those cases which present a combination of the symptoms of diphtheria and scarlet fever. The nose is the site of its active fire, and is excoriated, swollen, bleeding, discharging thin, acrid coryza, translucent or bloody. Excessive, acrid salivation; throat sore, raw, excoriated; sensation of heat in the throat. Swollen glands, bleared eyes, excoriated lips and nostrils. Great restlessness, scant urine, intermittent pulse, mouth studded with ulcers.

Ammonium consticum.—Laryngeal types with diphtheritic croup, hoarse voice, aphonia. Suffocative attacks with whooping inspiration and intense anguish. Pulse wiry and rapid, and breathing labored, short and hurried; all symptoms intensified by the anguish due to threatened asphyxiation. Deep redness of the fauces with larynx and lower part of the pharynx covered with white exudate. Burning, acid discharges flow constantly from the nostrils. Even tears blister the canthi and cheeks.—Allen.

Ammonium carbonicum.—Diphtheria in hemorrhagic subjects with fluidity of blood. Epistaxis follows upon the washing of the hands or face in morning. There is stoppage of nose, chiefly at night; must breathe through mouth; the child starts from sleep unable to breathe; has an unconquerable appetite for sugar (*Argentum nitricum*). There is a rawness of mouth and throat when swallowing. The tonsils are enlarged, bluish and tend to gangrenous ulceration. Manifested in scarlatinal diphtheria, glands engorged; Compare *Apis* and *Ailanthus*. *Ammonium carbonicum* should never be used before or after *Lachesis*.—Allen.

Kreosotum corresponds to malignant diphtheria of the fauces and buccal walls. Mucous membrane becomes soft, black and necrotic (*Carbolic acid*). It is especially suited to scrofulous, tuberculous subjects and sluggish, lymphatic children, with glandular enlargement, especially in the cervical region.

Sulphuric acid has extensive and deep ulcerations of the throat, and extensive exudation of a grayish or lemon color. There is great pallor, weakness and a sensation of trembling without really trembling. Child wishes to be held snugly because of

this unpleasant sensation, which symptom, however, has to be interpreted to be understood. Vomiting or gastric hemorrhagic oozings, and passive nasal hemorrhages.

Nitric acid is indicated in severe manifestations of nasal diphtheria with sharp, persistent, arterial hemorrhages. Discharges from the nose watery or bloody-watery, very offensive and generally excoriating. There are whitish deposits in patches in the nose and throat, and the pains in the buccal ulcers are biting and stinging in character. There is unusual distress and heaviness in the stomach, and anorexia is persistent. The *Nitric acid* local manifestations are deep seated and destructive. All symptoms are worse at night.

Veratrum album corresponds to the state of collapse. Cold breath (*Carbo veg.*), cold extremities, cold sweat. Painless, watery, or transparent diarrhea.

Naja is another serpent poison that should not be forgotten. Its suffocating spells on lying down and its impending heart paralysis are diagnostic. Suffocative spells after sleep, no matter how short the nap (*Lachesis* symptoms are worse after sleep). Cough hoarse and rasping and difficult. Cyanosis, gasping, pulse thready, filiform, intermittent.

Lac caninum is highly extolled by many very competent observers. The exudate begins on the left side and goes to the right, transferring from one side to the other repeatedly. The pains also fly from one side to the other incessantly. Ulcers form on the tonsils and the faucial walls. Deposit dirty-gray and shiny. Manifested by laryngeal diphtheria exudate extending from below upward. Breathing hoarse and croupy, great anxiety and restlessness adding to the discomfort. Pricking sensation as if the mouth and throat were full of splinters.—Allen.

TREATMENT OF DIPHTHERITIC PARALYSIS.—Fortunate it is that the paralysis of diphtheria is peripheral and not central, temporary and not permanent. It is a quite common complication, but usually readily curable or spontaneously recoverable. It is more apt to occur when local measures are resorted to early and persistently; it rarely occurs under purely homeopathic treatment.

Gelsemium is one of the chief reliances. It covers local numbness and tingling, and surface anesthesia. Hands and feet are numb and tingle. Muscles of the neck and small of the back weak and lame. Legs "wobbly," staggering. Diplopia; drooping of the eyelids.

Argentum metallicum presents anesthesia of the roof of mouth and fauces, and difficulty in swallowing from lack of response to the presence of food or drink.

Lachesis is especially suited to the left side paralysis. Ptosis on left side. Left side of face expressionless. Paralysis of left side of velum palati, left sided deafness and paralysis, or weak-

ness, numbness and tingling of left arm and leg. It will be useful in cases involving also the right side provided the left side be more especially affected.

Zincum phosphide covers both diphtheria and scarlatinal paralysis of the pharyngeal muscles, and locomotor ataxia symptoms succeeding to either disease. Sensation as if walking over velvet. Inability to walk straight if blindfolded. Mental concentration essential to perfect co-ordination.

Secale covers palsy, tingling of tongue, numbness of extremities, shriveling and old look of skin from defective nerve nutrition.

Plumbum metallicum. Coldness of hands and feet: inability to get them warm. Semi-paralytic torpor of intestinal tract, resulting in extreme constipation. Acute intestinal pain. Trembling weakness of the lower extremities.

Cocculus.—Involvement of both motor and sensory functions. Sensation as of swaying motion of body and limbs. Feeling of tottering without doing so. Tendency to fall upon rising. Vertigo while lying (*Cornu*).

Alumina is a remedy too often overlooked in post-diphtheria paralysis. It is often indispensable in the catarrhal affections of the throat occurring as sequelæ of diphtheria. Defective assimilation and nutrition are forerunners of paralytic affections, and over these processes this remedy has a wonderful control. It is specific where there is inability to walk except with the eyes open and in the daytime. When eyes are closed, whole body totters. There is great heaviness of the limbs, can scarcely be dragged. Soles of feet are sore when walking, as if soft and swollen. Arms and legs are heavy; there is great lassitude of limbs. Involuntary movements of single parts. Faint and tired, must lie down. Slow, tottering gait. Constipation, inactivity of the rectum, even soft stool requires great straining because of paralytic torpor.

Conium.—Paraplegia, lower extremities. Burning, tingling in mouth and fauces. Ptosis and paralytic affections of right side.

Galvanism and Faradism have been used with varying success, the former for its general effect upon the nervous system and the latter for its supposed nutritive effect over areas of anesthesia. Faradism is also employed for purposes of muscle-massage in post-diphtheritic atrophy. But it should be used with great caution, for it often converts a functional into an organic lesion.

Papain, Trypsin, Pepsin, and other proprietary digestive ferments, have been highly lauded as topical solvents of the diphtheritic exudate. Their efficacy is still a matter of doubt. The theory of their application seems plausible enough if diphtheria is viewed as a local disorder. At best, however, it can only be hoped to scavenge away some of the debris by their use. In a curative way nothing need be expected of them.

CHAPTER XIX.

MEASLES.

General Considerations—Symptoms and Course—Stage of Incubation—Stage of Invasion—Eruption—Complications—Bronchitis—Catharrhal Pneumonia—Conjunctivitis—Otorrhœa—Laryngitis—The Kidneys—Diseases of the Digestive Tract—Noma—Gummitis—Diarrhœa—Paralysis—Black Measles—Diagnosis—Prognosis—Prophylaxis—The Sick-Room—Diet—General Treatment—Diarrhœal Treatment—Treatment of Fomication—Tissue Remedies.

General Considerations.—Measles is one of the commonest of the infectious diseases of childhood, and its contagious principle, for it is highly contagious, possesses such activity that usually when the disease is seen to exist cases are very numerous, and in individual families a number of children are apt to be ill at the same time or in quick succession. The initial symptoms of rubella are catarrhal in character. Suffusion of the eyes, injection of the conjunctiva, coryza, sneezing, and a rasping hoarseness are present, in many instances to such degree as to suggest that the child is suffering from acute influenza.

Measles is another of the infectious diseases presumed to be caused by a specific poison. English and continental investigators claim to have discovered in the breath and secretions of the measles-patient special micro-organisms, found to exist also in the lungs, liver and skin. Its contagious principle is undoubtedly given off in the breath and emanations from the body, its spread from person to person being by direct contact. It is possible that the infectious germ may be carried in woollen goods, but cases in which the disease is spread in this manner are very rare.

Contrary to the rule in most infectious diseases the infective principle of measles is active from the beginning of the incubative stage, most active in virulent forms in the catarrhal stage, when the fever is high, just before the eruption begins. It continues, however, during the period of the eruption, not dying out until the end of the third week of the disease. It is not nearly as active during the subsidence of the eruption as during its coming.

Measles prevails generally in the colder months, more than twice as many cases occurring in winter as in summer. Sometimes epidemics will run rife in the early spring. It may be that this greater prevalence in winter is due to the fact that children are housed more during the colder months, but it is not unlikely that climatic influences have of themselves some bearing on these circumstances. Outbreaks are very frequently noticed upon the assembling of children at school, and measles is disseminated very widely when occurring among children attending school. It is

especially a children's disease, very few persons escaping it in childhood, but it is by no means limited to children. I have met with a good number of cases in adults. As a rule it occurs but once during life, though one attack is not as certainly protective as is an attack of scarlet fever. For during the presence of a severe epidemic the disease will oftentimes be developed in adults who distinctly remember to have had it in childhood. Furthermore, anomalous cases occur in which an individual may be attacked in successive years. While practicing in Texas the author witnessed the presence of measles, well-defined, in three successive years in an adult patient, and upon two other occasions I have observed well-marked outbreaks of measles in two successive years, also in adult life. It is interesting to note how some people escape measles in early life, and repeatedly run from it, only to have it, and as a rule much more severely, in later years. In one instance that I now recall, a lady, the wife of a former governor of Texas, ran from the disease as from the plague, because of the death of a sister occurring in her childhood, for nearly fifty years, avoiding it sedulously, only to be finally taken ill with it when nearly sixty years of age.

The fact that this disease is characterized in its early stages by catarrhal inflammation would lead to the opinion that its virus is, perhaps, introduced into the blood through the respiratory tract. Certain it is that the breath of a measles patient and the emanation from his body during the active febrile stage are most active influences in the production of new cases.

It has been said that measles attacks subjects of all ages, and it may be said with equal truth that the unborn fetus may suffer from it.

It is rather unfortunate that this disease is looked upon by the laity as one of the least dangerous of the diseases of children, and it is equally unfortunate that this opinion is supported by the carelessness and indifference of the medical profession. While it is true that in mild epidemics there is little or no mortality, and that even in severe ones the death rate does not compare with that of scarlet fever, yet occasional epidemics are met with in which a great number of lives are sacrificed. Especially is it attended by fatality when occurring in army or other camps, or in jails, tenement houses, or any crowded quarters, the more especially if these outbreaks occur during severely inclement weather and among people who are ill-nourished, poorly clad and housed, and otherwise likely subjects for infectious diseases. Furthermore, while measles may not have a large direct mortality yet it is the remote cause, beyond question, of a great many deaths from phthisis pulmonalis, dysentery, and diarrhea, which oftentimes follow immediately upon recession or incomplete development of the eruption; and it is my conviction that it is as much the duty of the physician to be as careful with patients suffering from measles until they are fully

convalescent as if they were suffering from other infectious diseases.

Symptoms and Course.—For convenience of description it may be said that measles presents several distinct stages, as incubation, invasion, eruption, and desquamation.

The stage of incubation lasts usually from twelve to fourteen days, longer than that of the severer exanthemata. It is possible, however, that true diagnostic symptoms may present themselves within a week of exposure, and, on the other hand, authentic cases have been reported in which no evidence of the disease has made itself manifest until the twentieth or twenty-first day. As a rule there are no special symptoms to be noted during the incubative stage, except that in exceptional cases there may be some lassitude, headache, loss of bodily strength, and general malaise.

The stage of invasion is generally pronounced. There will be chill, or chilliness, and some feverishness; there may be vomiting and nausea, headache and pain in the back and limbs. With these symptoms there are always present evidences of catarrhal irritation of the respiratory and ocular mucous membranes, as sneezing, sniffing, rawness of the throat, and hoarseness, burning, coryza, injection of the conjunctiva, more or less suffusion of the eyes, etc. Besides these symptoms there are generally present irritation and inflammation of the mucous lining of the larynx and cords, with attending rasping hoarseness and cough of a croupy character. It is usually four or five days from the time of the ushering in of the first symptoms of invasion until the eruptive stage is reached.

The eruption is first seen in the roof of the mouth, buccal walls and on the mucous membrane of the lower lip. The careful observer will detect the enanthem from twelve to twenty-four hours before the first meazley spots are seen upon the skin. Generally on the morning of the fourth or fifth day, sometimes earlier, and rarely later, there are to be seen elevated bright or deep red millet-seed spots, first upon the forehead and cheeks. Even before their appearance they can be felt as resisting points beneath the skin about the time of their presence in the mouth. While each meazle stands out as an individual spot, they are gathered in crescentic patches upon the forehead and cheek and coalesce and aggravate *en masse* until the entire face, forehead and



FIG. 27.

neck are covered with great blotches of the eruption. When this is well established the face will be greatly swollen and puffed from their presence. Coincident with their development upon the face measles will appear upon the inner surface of the forearm, and will spread from these separate points over the entire chest and by the seventh or eighth day over the entire body. While nearly always confluent on the face the eruption is usually discrete over the body and limbs. It generally reaches its height in from thirty-six to forty-eight hours from the first appearance of the measles eruption, and will then remain in full efflorescence for nearly as long a period of time.

The development of the eruption is coincident with the pyrexia of the disease. It is when the fever is at its height that the temperature shows a range of from 103° to 104° or higher, and that the eruption develops in its fullest blossom; and as soon as its development is complete the fever will begin to subside and the temperature will rapidly fall, resuming the normal within two or three days. This occurrence is peculiar to measles and is a diagnostic symptom of no mean value. The presence of the infective ferment in the blood develops the measles fire and it burns with marked intensity until the eruption is completely developed, when it will subside with a suddenness not common to other eruptive diseases.

Not usually this quick fall of temperature is begun before the eruption is fully effloresced. The measles fever lasts at its zenith about forty-eight hours, and continued pyrexia implies, as a rule, some complication which will probably develop within a few days. Its highest range occurs about the sixth day and a decline to or about normal occurs on the seventh or eighth, without the morning and evening variations belonging to other infectious diseases.

In unfavorable cases, or when measles patients have been exposed to much raw, damp weather, the eruption may not develop favorably. When retarded, the patient suffers much more severely with headache and bodily distress and the skin will present a mottled appearance, the eruption being discernible beneath it. The death rate is much larger in these cases, and even the laity understand the necessity of bringing measles to the surface.

In cases in which retardation of the eruption occurs bronchitis and pneumonia are not uncommon results; or the case may take an enteric form from metastasis of the eruption to the intestinal membrane. In enteric complications there may be acute enteritis, with increase of fever, intestinal pain, abdominal distension, and even peritonitis. Diarrhea may also occur and is, in fact, one of the commonest complications of the disease. In some epidemics there seems to be an affinity between the eruption and the intestinal lining, with diarrhea as the prevailing result. This occurs frequently in raw spring weather, and epidemics presenting these

tendencies are usually attended by high mortality rates. In one epidemic the author witnessed a very large death rate from typhoidal diarrhoea, occurring, be it said, in almost every instance in old school practice.

In summing up the natural and convenient division of measles into stages it may be stated that the incubation state lasts about fourteen days. The stage of eruption, or efflorescence, if presenting a normal course, occupies from two to four days more, usually about seventy-two hours being required from the first appearance of measles in the mouth to its complete efflorescence on the face and body. Retarded cases may be slower and the eruptive stage may occupy even five or seven days. Next follows the stage of desquamation, which covers a period of three or four days. The exfoliation of measles is not like that of scarlet fever, but consists simply of a branny or furfuraceous scaling of the skin. It is usually in direct correspondence to the intensity of the fever and eruption, and in mild cases may be but slightly or not at all noticeable. This stage corresponds to the stage of decline of the disease, as described by some authors, but it is doubtful whether it is exactly correct to denominate it a desquamative period.

Complications.—As has already been mentioned bronchitis, pneumonia and intestinal troubles are attendants upon cases of measles in which the eruption is retarded or in which it has been repelled. In some epidemics intestinal disorders predominate, while in perhaps the majority of cases in which complications arise the respiratory tract is most likely to be involved.

BRONCHITIS.—This is not especially a dangerous complication, yet it is one to be avoided. In very young children it may present in the capillary form and cause a great deal of apprehension, and in some instances result fatally. In those cases in which the smaller bronchial tubes are involved the respiration will be greatly increased, the skin becomes hot and dry, and the infant will toss incessantly because of increased dyspnea from obstruction of the smaller tubes and bronchioles. During respiration, as the air permeates the smaller divisions, hissing, snoring, or whistling sounds are to be heard upon auscultation. Later the sibilant rales become more crepitant, and as increased secretion of mucus from the tubes occurs they become more distinctly mucous or bubbling, and convalescence quickly follows, almost all cases resulting favorably. In rarer instances mucous rales are present from the start. Or, when the fever is high and the congestion marked the case will pursue the course belonging to capillary bronchitis from other causes. This complication is apt to pursue a course of a week or ten days' duration. It is generally attended by considerable disturbance of the digestive functions, as loss of appetite, heavily coated tongue, constipation, or diarrhoea, foul breath, and sometimes nausea and vomiting.

CATARHAL PNEUMONIA.—Lung inflammation occurs in undeveloped cases, occurring particularly in debilitated children and those of strumous diathesis. True lobar pneumonia is much less common, and, which is not usually the case, has much less fatality than the catarrhal variety, the latter generally existing co-incidentally with bronchitis and resulting oftentimes in atelectasis. Catarrhal pneumonia is always to be anticipated and guarded against when the fever continues beyond the time necessary for the proper development of the eruption, especially when the latter is very incomplete. The cough which attends the initial catarrhal symptoms will have continued, or there will be a rather sudden ushering in of a hard, dry, painful cough with increased rapidity of breathing, marked shortness of breath, increasing restlessness and manifest general distress. Percussion will reveal dullness over considerable areas, usually at one or both of the apices, with sibilant rales, decrease in the vesicular murmur, and, if the case be severe, more or less immobility of one or both sides of the thorax. The pulse beat is much more rapid, hard and wiry, and the temperature is maintained at the measles maximum, or may even rise to 104° or 106° in cases presenting the usual course of pneumonia in children. As may readily be inferred, pneumonia is much more frequent in children of tuberculous parents and in those illly nourished and not comfortably clad. It has been held that its occurrence is almost in every instance due to exposure to drafts of air, sudden changes of weather, improper bathing, or sudden recession of the eruption.

Perhaps not sufficient consideration has been given to the anatomical and physiological relation existing between the skin and mucous membrane. It is well known that repelled eruptions, no matter what their nature, are apt to show effects upon the mucous membranes of the body, especially of the bronchial tubes and intestinal tract, and the development of diseases of this tissue from the repelling of measles is by no means anomalous. Late authors are disposed to ascribe pneumonia as a complication of measles to the evolution, by the disease, of latent tuberculosis, and it is not held to be likely that its development is due to re-infection or sepsis, as in scarlet fever and diphtheria. It has been shown by Ziemssen that tubercle bacilli may remain dormant in the cervical, bronchial, and other glands, and this makes it easier to understand the proneness to complications of the respiratory membrane in all eruptive disorders, measles especially. The pneumonia of measles lasts about the usual course of this disease from other causes, though in especial instances protracted complication and a general wasting and a consumption of the entire system follows, without presenting the course common to phthisis.

CONJUNCTIVITIS.—This is a not uncommon and a very annoying complication and sequel to measles. In children predisposed to

weak eyes the conjunctival symptoms of the invasion stage are pronounced. There will be intense injection, profuse lachrymation, photophobia, and general ocular distress. Instead of these symptoms subsiding with the development of the eruption they will continue as the disease progresses.

In scrofulous subjects ophthalmia is one of the commonest of the sequelae of the disease. Beginning as an ordinary catarrhal inflammation the conjunctiva soon becomes thickened and swollen and quickly determines into a case of granular conjunctivitis. The lids remain swollen and puffed, their edges hot, glistening, and very red. The secretion is profuse and the tears may be mixed with mucus. Careful examination of the conjunctiva will show the tarsal part, especially of the upper lid, to resemble very much the granular surface of a wound. This is covered with nodules, which bleed easily when touched and which are beefy-red and very painful, the condition soon resolving itself into a typical case of trachoma. As time wears on the edges of the lids become thickened and scaly, and there is finally established a confirmed marginal blepharitis. Oculists find themselves able to trace a great many cases of trachoma back to measles in childhood.

OTORRHEA is not so common a complication or sequel as with scarlet fever. Occasionally, however, suppuration occurs, with perforation of the drum membrane and subsequent partial deafness. It may be suggested that subjects in whom purulent conjunctivitis presents as a complication may also have middle-ear disease.

LARYNGITIS is quite common during the height of the disease. Very few measles patients escape without a marked degree of hoarseness and rough, croupy cough, and in occasional cases, especially those predisposed to throat and lung ailments, the laryngeal affection becomes permanent with chronic thickening and relaxation of the chords and confirmed huskiness of voice.

THE KIDNEYS are not usually involved in measles, nephritis being so rare a complication as to be hardly deserving of mention.

DISEASES OF THE DIGESTIVE TRACT are among the most common of the sequelae of tubercula. From simple stomatitis affections of the alimentary membrane may be met with up to confirmed gastritis or incurable or chronic diarrhea. In scorbutic children even gangrenous conditions of the mouth may be met with. Now, one of the most malignant of all ulcerative diseases of childhood (Fig. 1, Plate II), is occasionally seen as a deplorable complication in cachectic children living under unfavorable hygienic conditions. While exceedingly rare, yet measles is one of the pronounced causes of the destructive process.

THE GASTRITIS of measles presents the usual phenomena belonging to inflammation of the stomach. Redness and dryness of the tongue, patches of ulcers on the buccal walls or fauces, thirst, with difficulty of swallowing from the condition of the

fauces, or, perhaps, intense pain from deglutition from the irritation of food or drink upon the mucous membrane, together with epigastric tenderness and some heat and other constitutional symptoms, with almost incessant nausea or vomiting upon the introduction of anything in the way of nourishment into the stomach, complete the gastric picture.

DIARRHŒA is a very common complication of measles and is sometimes a very distressing sequel, especially in Southern climates and during raw, spring weather, but occasionally accompanying epidemics occurring during very hot weather. The stools are usually gushing, watery, offensive, profuse, and apparently painless at first, but soon become smaller, slimy, and irritating, and attended by considerable pain and tenesmus. In occasional instances dysentery follows, and the intestinal tract will give evidence of a general catarrhal process and destructive changes in the membrane, even to ulceration.

PARALYSIS is another very uncommon sequel to measles. When occurring it is much more likely to present as paraplegia than as lateral involvement. Even fatal cases of upper paraplegia have been recorded, marked vascular changes being found upon post-mortem in the gray matter of the cord. However, severe nerve lesions are exceedingly rare; and fortunate it is that this is so, as the wide spread of the disease would result in a vast army of paralytics were such sequelæ as common as in diphtheria.

The pertinency of the statement made in the early part of this chapter shows, *en passant*, as an unchallengeable fact, namely: it is the complications of measles that are to be dreaded. Uncomplicated the disease runs a favorable course and is among the milder affections of childhood; but many lives are lost through its complications, especially among intestinal disorders and cerebral congestion.

Black Measles.—Unusually severe cases of measles, attended by very high fever, with dry, brown tongue, sores on the lips and teeth, delirium, through active or passive complications due to congestion of the lungs or brain, with the eruption presenting in dark purple color, and purpuric spots occurring more or less generally, giving to it a much darker appearance than naturally belongs to it, are denominated black measles. This type is much more malignant than plain, ordinary measles, and is very frequently attended by hemorrhages from the nose, severer than in ordinary cases, while delirium, coma and convulsions are frequent accompaniments. The attack is usually very sharp and the stages acutely defined. Albumin is nearly always to be found in the urine, which is scalding and hematuric. There is not infrequently a good deal of glandular enlargement, the parotid, especially, showing considerable enlargement and occasionally breaking down in suppuration. Black measles is to be dreaded. It is a really

serious form of the disease and is often attended by a high mortality rate, especially when occurring in pronounced epidemics in unfavorable seasons and under unfortunate surroundings.

Diagnosis.—As a rule the diagnosis of measles is not attended with difficulty. The unusually long stage of incubation where exposure can be traced is of itself almost sufficiently characteristic to indicate the coming of rubella. Of course the diagnosis is materially simplified when the prevalence of measles in a community is known.

In the initial or invasion stage there is little likelihood of confounding measles with scarlet fever or diphtheria, in neither of which is there the distinct catarrhal stage of this disease. The one condition from which it may have to be here differentiated is acute influenza, which presents all the catarrhal symptoms of measles but which is lacking in the high temperature, rasping voice, and equally swollen features. By the end of the second or third day the presence of the eruption in the mouth will settle the diagnosis as between measles and simple influenza.

There is really little greater difficulty in differentially diagnosing scarlet fever and measles. The former has suddenness of onset, nausea and sudden vomiting, acute sore throat, without laryngeal hoarseness at the start, and unusually rapid pulse-rate, and does not present the positiveness of coezya of measles. When confusion occurs it usually hinges upon the eruption, and careful analysis will suffice to clear the diagnosis. Measles first appears upon the mouth, next upon the face, and then upon the inner surfaces of the forearms. Scarlet fever does not have the mouth eruption, and first appears upon the upper portion of the thorax and neck, gradually spreading over the body. The measles eruption is rough and elevated, is an eruption on the skin, while scarlet fever is generally smooth, a true inflammation of the skin. Even when somewhat rough it is lacking in the discrete points of measles. As may be inferred, confusion is much more likely to occur when there is not a proper development of the skin symptoms, but there should not be great difficulty in determining between the two diseases even here; for in undeveloped measles there is a marked roughness or granular sensation imparted to the fingers upon pressing over the skin in undeveloped eruption, as though very fine bird-shot were lodged underneath the cuticle.

The rash appears at first in hard, isolated papules and may sometimes be mistaken by the careless observer for small-pox. But not only are the eruptions quite unlike, but that of small-pox is vesicular, its apex presenting a clear lymph-space, generally, underneath the epiderm, while, as stated, the eruption of measles is papular, even nodular. Furthermore, the constitutional symptoms should mark the difference, small-pox being attended by very severe pains in the back, especially in the lumbar region, and ac-

accompanied by obstinate vomiting. There is more likelihood of confounding measles and rotheln, or German measles, formerly considered a cross between measles and scarlet fever, but now recognized as a distinct ailment. Rotheln, or rubella, presents less of catarrhal stage and the papules are lighter in color, much smaller, and show no tendency to irregular aggregation. The prodromal stage is briefer and the temperature does not usually rise above 100° or 101° . The rash presents earlier than measles, usually on the first or second day, and the whole course of the disease is milder. It resembles the eruption of roseola, or rose-rash, and even of some of the acute exanthematic rashes. Syphilitic rashes are mentioned in connection with the differential diagnosis of measles by some authors, but are hardly worthy of consideration in this connection.

The experienced physician will sometimes be able to diagnose measles by olfaction—"He smells measley." This disease and small-pox have odors peculiarly their own. Both are difficult of description and must be smelled to be appreciated. The measley odor is due to the degeneration of cheesy material secreted by the sebaceous glands and is strong and cheese-like. The odor of small-pox is much more pungent and putrid.

Prognosis.—The general impression that measles has an insignificant mortality will be dispelled by examination of the health records of large cities. It ranks third in the list of eruptive diseases in its death rate; this is not due to the disease *per se*, but pneumonia, general tuberculosis and intestinal disorders following in its wake cause it to present a really considerable mortality. The mortality statistics of Chicago for 1893 give 975 diphtheritic deaths, 329 scarlet fever deaths, and 234 deaths from measles; from which it will be seen that even the disease itself, this classification not including deaths occurring from sequelæ, caused more than one-half as many deaths as were caused by scarlet fever in that year, and about one-third as many as are charged up to diphtheria.

The prognosis is influenced materially by the constitutional conditions and hygienic surroundings of the patient. In foul tenement houses, in camp life, and among Indian and half-breed tribes, about all of which insanitary states exist, the mortality is large. Children under two years of age present a larger mortality rate, owing to capillary bronchitis, than children above six years.

Unfavorable symptoms are failure in development or irregular course of the eruption, or its recession; excitable or irritable mental state, especially when manifested by fear or dread; stupor, or coma, and convulsions; steady high temperature after full efflorescence; flushed, besotted expression of the face, or extreme pallor of the countenance after sudden subsidence of the rash; bronchial and lung complications; unusually persistent cough; shortness of

breath, pain upon coughing and rusty expectoration, or exceeding huskiness and dryness of cough; recession of the eruption to the intestinal tract, with obstinate vomiting or diarrhea. Intense headache, with sharp lacerations in the brain, commencing delirium and sudden unconsciousness, indicating recession of the eruption to the meninges, are also among the unfavorable symptoms presenting in the course of measles.

Prophylaxis.—There is not much to be done in connection with the treatment of measles in the way of prophylaxis. The spread of the disease is usually so rapid that where a case is recognized in a family or school the reasonable probability is that other children exposed to the sick child will develop it, hence isolation is not usually effective, as in scarlet fever and diphtheria. But at the same time it is beyond question better to have delicate children, especially those predisposed to phthisis, removed at once from infected houses or kept away from them and placed as far as possible from danger. Children who are just recovering from the disease, and children who are members of a family in which it is prevailing, should not be allowed to attend school because of the almost certain spread of it through this means. It is not believed that the infective principle is rapidly disseminated by means of third persons, clothing, etc., and yet it is not regarded as improper to insist upon the exercise of due caution on the part of the adult members of a measles family who may come in contact with other children.

The Sick-Room.—The room of the measles patient, as in fact all sick-rooms, should be large and well ventilated. Stuffy, contracted quarters conduce to the development of bronchial and lung complications. On the other hand, it is not wise to expose the patient to direct draughts of air through open windows or doors in the effort to secure good ventilation. Because of the odor from measles the sick room will smell strong and offensive, and especially will this odor be noticeable if, in the effort to develop the eruption, free perspiration be induced. While the occasional brief airing of the sick-room is demanded, caution should be exercised not to bring about the repelling of the eruption or the development of throat and lung complications through carelessness in this respect. As in all eruptive fevers, equability of temperature and the general physical comfort of the patient are demanded. Common sense will dictate the wisdom of darkening the windows in cases characterized by severe ocular symptoms, and when for purposes of ventilation the room must be lightened the patient's eyes should be covered by dark material to guard against the photophobia which ensues from direct exposure to bright light.

Diet.—The diet of measles children should be varied and nutritious. Milk is perhaps the best diet in most cases, yet milk-toast, broths, gruels, blanc-manges and other similar dishes are permis-

sible. In fact, except in cases showing gastric disturbances, there is no special necessity for unusual caution in this regard. Where the stomach is involved, however, the cuisine will have to be modified accordingly. Here the total or almost total suspension of food for days at a time may have to be practiced, rectal alimentation being relied upon to tide over. The practice of drenching the mussy patient with hot lemonade or other hot drinks to bring out the eruption is objectionable. By this practice diaphoresis is induced, and the danger of bronchial and lung complications from the taking of cold is correspondingly increased. Gentle perspiration is not objectionable, but a drenching perspiration is decidedly so. It is better in retarded cases, or where there is recession of the eruption, and especially with the development of brain symptoms, to administer the hot pack, or hot bath, subsequently wrapping the child in a blanket, to determine the presence of the rash to the skin. In more than one instance I have known the use of hot lemonade to induce a diarrhea which has proved to be quite intractable. Cool, but not ice-cold, water is always permissible *ad libitum* in this disease, except in gastric complications, when even small quantities of water will often aggravate the vomiting. Here sips of hot water will serve to allay the gastric irritation and be relished.

Treatment.—*Acowite* will very naturally be thought of at the beginning, because of the manifest correspondence between the symptoms of the invasion stage and this drug. Ushered in by chilliness, sharp fever, with quick pulse, dry, hot skin, restlessness, and much thirst, *Acowite* well covers a large portion of commencing cases. Besides the symptoms enumerated this remedy corresponds to the catarrhal irritation, ocular congestion, photophobia, sneezing and other symptoms attending irritation of the mucous membrane.

Euphrasia presents a more active catarrhal stage than *Acowite*. The eyes fairly stream with tears, and the conjunctiva is red and swollen. There is profuse nasal coryza, with much rasping of the throat, cough worse during the day, ameliorated at night. Prior to the development of the eruption there will be intense throbbing, bursting headache, relieved as soon as the eruption begins. *Euphrasia* has long been a favorite remedy with the author in cases characterized by great catarrhal intensity. It has been found especially useful in severe coryza when given in the thirtieth attenuation. There will be unusually bright expression of the eyes, in spite of the catarrhal involvement, and the dryer and hoarser the cough the more this remedy will be indicated.

Gelsemium is very useful in the eruptive stage in chilliness intermingled with heat as the eruption develops. There may be a good deal of sneezing and sore throat, with excoriating discharge from the nostrils. In its action upon the skin *Gelsemium* devel-

ops an itching and redness of the integument, and an eruption not unlike that of measles is produced by it, thus supporting its use in rubella. It is also indicated in undeveloped eruption, with pain at the base of the brain, high fever and passive brain symptoms.

Bryonia is especially adapted to cases attended by dry, painful cough, soreness of the limbs and body, hard headache, and exceeding hoarseness, much oppression of the breath, and stitches in the chest, with slow development of the eruption. This is one of the very first remedies in the materia medica for this disease when the eruption is retarded, or if recession of the measles-rash occurs, with aggravation of the chest symptoms and cerebral complications of mild intensity. I have used it in the lower attenuations, up to the twelfth, but am convinced that in young children it does better service if given higher.

Dalcamara is especially to be thought of in cases characterized by the severe aching of the limbs and body, intense restlessness and a lack of the usual catarrhal symptoms. There will be some suffusion of the eyes and other catarrhal symptoms, but *Dalcamara* best suits cases in which absence of coryza is compensated for in severity of bodily suffering. When recession of the eruption occurs from exposure to damp, cold air, or very sudden changes of the weather or cold, damp, rainy weather, this remedy will be found very useful.

Belladonna comes in at the commencement when the face is red, the eyes much injected, the throat very sore, with a sense of spasmodic constriction, the pulse quite rapid, but more compressible than that of *Acute*, and instead of the hot, dry skin of the latter there is a combination of heat and moisture. Swallowing is difficult and its painfulness is annoying because of the intense thirst arising from the dryness of the throat. The full, sharp headache of *Belladonna*, when occurring in measles, will suggest this remedy, and it will be thought of also when there is delirium with mutterings, or the face is full and purplish and bloated, convulsions threatening. The skin generally corresponds more nearly to the smooth variety of scarlatina than to measles, but its general symptoms, together with great blotches of measles aggregated over the face and neck will call for it quite frequently in this disease.

Pulsatilla is indicated in the blonde child with dry coryza, and when the cough is dry at night and loose in the daytime. It may also be well suited to cases showing profuse lachrymation, in typical *Pulsatilla* subjects, especially if there be gastric symptoms and not very much fever; the *Pulsatilla* child is disposed to earache and frets and worries over its pain and the itching of the eruption until it becomes sick at the stomach. This remedy will also be found useful in retarded or receding eruption attended by nausea and vomiting. The eyes show considerable involvement in *Pulsatilla* cases, simple catarrhal ophthalmia being often

present, the lachrymation, which is profuse at first, being followed by purulent secretion which agglutinates the lids and fills the canthi every morning.

Kali bichromicum in its pathogenesis presents an eruption which closely resembles measles. It is rarely given in the first stages but will be found very useful late in *Pulsatilla* cases. Farrington puts it that it "usually resembles *Pulsatilla*, only it is *Pulsatilla* much worse." It is especially useful in purulent ophthalmia, the cornea being ulcerated, or vesicles or pustules forming thereon. There is much soreness and ulceration of the nostrils with the discharge of nasty, thick, yellow mucus. *Kali bichromicum* cases also present swelling and induration of the glands of the throat and neck, with shooting pains extending from the ears into them. When the suppurative stage is unusually well marked the middle ear will suffer as well as the eyes and nose, and sometimes independently. There may be profuse discharge from one or both ears. *Kali bichromicum* is one of our most useful remedies also for laryngeal affections, with hoarse, dry, croupy cough. A symptom quoted by most authors as belonging to this drug, which I have never met with but which is held out to be one of its most characteristic indications, is "Violent stitching pains extending from ear to roof of mouth and to the parotid gland on the affected side," and though I have never met with this symptom I can strongly affirm the adaptability of this remedy to the nasal, oral, and glandular conditions of measles.

Arsenicum is especially applicable to malignant types of the disease. The complexion is sallow, with bloated face, alternately pale and red, and recession of the eruption and adynamic typhoid symptoms. Diarrhea is a common complication when *Arsenicum* is called for. In black measles with rapid sinking of strength, muttering delirium, great restlessness, extreme debility, and impending dyspnea, with hemorrhagic petechia which give this form its name, it will be found most useful. In the typhoidal diarrhea of severe complications *Arsenicum* is also a reliable remedy. The stools are gushing, dark brown or greenish, very offensive and exhausting. The aggravations occur after midnight and in the afternoon. The typical *Arsenicum* thirst is sometimes present, and the drinking of water will be followed by almost immediate ejection of the contents of the stomach. In low adynamic types of measles *Arsenicum* is without a superior, its characteristic indications being nearly always present in this form of the disease.

Crotalus is another remedy to be thought of in black measles. There are intense fever, general bloating of the face and eyes, delirium, confluent eruption with hemorrhagic points shooting up here and there, and instead of the eruption dying off soon after full efflorescence it remains longer and part of it dies, or perhaps disappears and returns in mottled specks, especially over the face.

and neck. The conjunctival and nasal symptoms are permanent and severe, even to ulceration and semi-gangrenous states. The tongue is dry and cracked, and the lips are covered with sores, the condition being typhoidal even to putrescence. *Crotalus* and *Arsenicum*, also *Lachesis*, are closely allied and sometimes necessitate careful differentiation in harmony with the individual symptoms of each.

The *Lachesis* eruption is livid, the coryza is severe, the lips and inside cheek-walls are very sore and swollen. Prior to the development of the coryza there is a feeling of rawness, soreness and scraping in the mouth and throat, which passes off as mucus is formed to moisten the tissues. When this dryness is present there is also extreme dryness of the tongue with inability to protrude it, and a nervous trembling of the organ. It catches on the lower teeth and cannot be protruded or controlled, the patient being unable to direct its movements. The delirium of *Lachesis* is of the low muttering order, and is attended by sudden startings from sleep, all the symptoms of this remedy being aggravated upon suddenly awaking from sound sleep.

Drosera is especially useful in hoarse rasping cough similar to the cough of pertussis, with aggravations in the afternoon and evening. Cough comes in long paroxysms, causing the patient to catch and hold to the attendant. Sensation of suffocation, and persistent, tight, teasing cough, so irritating as to induce vomiting.

Caprum metallicum is one of the most useful remedies in the materia medica for the nervous symptoms attendant upon measles, manifesting in the form of convulsive twitchings. Violent delirium with pale or flushed face, and even convulsions, opathotomus, and violent crampings of the legs and feet characterize the action of this remedy. I have found it an exceedingly valuable agent in the sixth attenuation in cases of recession of the eruption and consequent convulsions.

Apis is also to be thought of in confluent measles presenting brain symptoms. The eruption evidently affects the meninges, and there are presented hard delirium, incessant rolling and tossing of the head, sharp piercing screams, swollen and puffy eyes and face, and redness and suppression of the urine.

Camphora is a very useful remedy for severe coldness of the whole body, with prostration, the face being pale or of a bluish-purple color and the skin, extremities and breath cold. With the surface coldness there will be intense internal heat, convulsions and fainting. *Camphora* is also useful in cases attended by cramping of the abdomen and limbs and choleraic diarrhea from sudden suppression of the eruption.

The chest symptoms of measles, as pneumonia, bronchitis, pleurisy, cough, etc., are best met by the following group of remedies:

Bryonia, which has been discussed in this connection, as also *Drosera* and *Kali bichromicum*.

Sticta pulmonaria has incessant dry cough, teasing, tickling, titillating, always worse upon lying down, so annoying as to keep the child tossing about the bed. It is usually worse at night and when the patient relaxes for a nap. In some instances there will be a good deal of oppression of the chest, with marked constriction of the inner thorax: but the characteristic symptom of *Sticta* is the teasing titillating cough.

Phosphorus has dry, bloody, exhausting cough, attended by much shortness of breath. The *Phosphorus* child shows exhaustion and will yield to typhoid symptoms. It is useful in typhoid bronchitis and especially when the intestinal tract is involved, as shown by copious diarrhea, abdominal distension or collapse, relaxation of the anus with involuntary escape of stool. The chest symptoms are also characterized by dullness upon percussion, dry, smothered rales, decreased vesicular murmur and marked dyspnea.

Kali hydriodicum has more of sneezing and nervous irritations than *Kali bichromicum*, and its coryza is more watery. It has sensation of fulness and tightness at the root of the nose, with much throbbing and burning in the nasal bones and forehead; stuffed feeling of the frontal sinus; stitching pains in the larynx and chest, especially from the sternum to the back.

Mercurius vivus is especially indicated when there is much inflammation and much swelling of the tonsils. It also presents profuse, fluent, acrid coryza, with smarting and burning of the eyes, and lachrymation or scalding, burning tears. Its chest symptoms consist of stitches in the right side of the chest, especially aggravated by sneezing and coughing. In this it somewhat resembles *Bryonia*.

Tartarus emeticus is called for in bronchitis and pneumonia, when there is a great deal of rattling and mucus in the chest, with moist and mucous rales audible over the upper portion of the thorax. Copious secretion of the mucus in the bronchi and throat. Cough sounds as though there were a great deal of mucus in the chest.

Sulphur is suggested in chest cases with pain, swelling, burning of the throat, cough worse in the evening and upon lying down, and, especially, stitches in the chest extending to the back and under the shoulder blades. Dyspnea upon rising or turning in bed. Pain feels better by lying quiet. In subjects of chronic cough with mucous rattling in the chest, torpor of the liver and bowels, and general *Sulphur* symptoms this remedy will serve an excellent purpose in the treatment of the coughs of measles.

Rhus toxicaria is sometimes called upon to relieve the severe pain of an especially trying, aching character in the pleural region.

and also for the short, dry cough arising from an incessant tickling in the brouchi.

DIARRHÆIC COMPLICATIONS.—*Arsenicum album* in high potency has been more frequently called for in my practice for the diarrhœa following measles than any other remedy. It is because the conditions presenting are usually those of *Arsenicum*, as low, typhoid state, watery, offensive diarrhœa, scurfs on the lips and teeth, great restlessness and anxiety, prostration, etc. Especially when the diarrhœa is very offensive, even to putridity, the discharge being dark, greenish and acrid, with coldness and blueness of the skin and great physical debility.

Veratrum album better suits those cases that simulate choleric diarrhœa. Cramps in the abdomen, limbs and feet, with gushing and painless diarrhœa. Frequent weak and intermittent pulse, with sudden sinking of strength and general collapse coming on suddenly.

Mercurius vivus is applicable to diarrhœa of a bilious character, brownish or greenish stools, very offensive, worse at night in cases preceded by constipation and gastro-hepatic symptoms.

Rhus tox is homeopathic to the typhoid state with diarrhœa, great restlessness, abdominal distension, recession of the eruption and the general *Rhus* condition. The stools consist of blood and slime mixed with reddish-yellow mucus.

Bryonia is applicable to the diarrhœa of measles when the chest is also involved, and when the bowel symptoms occur in sudden changes of weather, especially in late spring and early fall.

Rhodophyllum suits bilious diarrhœa, gushing, watery stools, at first painless, but followed by straining; stools exceedingly offensive, but not putrid as with *Arsenicum*.

Colobacum is useful in dysenteric conditions with shivering at the rectum, mucous or bloody discharges, attended by much tenesmus.

Aloe may also be called for because of intense straining, but the stools are brownish and the straining is present all the time.

FOURMAYOT.—During the course of measles in occasional cases the child will be driven almost to distraction by itching or formication of the skin. Here occasional doses of *Sulphur* will serve to excellent purpose.

Cantharis is also applicable to this condition, and its analogue, *Urtica urens*, will also be needed for the biting, burning, stinging itching from which the child will suffer.

Formic acid will give relief when the sensation is as though a million ants were crawling over the body and stinging the patient. The symptom is very annoying, and when exceedingly so applications of olive oil or aqueous solutions of a dilution of the remedy given internally will sometimes bring quick relief.

TISSUE REMEDIES.—*Ferrum phosphoricum* is commended in the early stages of measles for the catarrhal and inflammatory symptoms, especially if with the suffusion of the eyes and nasal coryza there is chest involvement, as localized pneumonia, attended by moderate fever, severe headache, with expectoration of bloody mucus and general engorgement of the chest.

Kali muricatum sometimes meets the hoarse, harsh cough, and is applicable also to glandular swelling. "Diarrhea of whitish or lead colored stools, which are very loose, attended by gastric irritation or heavily coated white tongue."

Kali sulphuricum applies to suppression of the rash; its recession is sudden, and is followed by unusual dryness and harshness of the skin. This will often be among the first remedies to bring the rash to the surface. It is also applicable to cases attended by exudation upon the skin of moist, clear mucus, which agglutinates in crusts.

Catalpa sulphurica is suited to lymphatic children with glandular enlargements and generally unwholesome constitutional conditions, with coldness of the nose and face, old shriveled look of the skin, and general atrophy and marasmus.

CHAPTER XX.

RUBELLA.

General Considerations—Symptoms and Course—Diagnosis—Prophylaxis—Medical Treatment.

General Considerations.—German Measles, Rubella, and Rotheln are names given a specific fever somewhat resembling, but still quite distinct from measles, that occurs from time to time both in sporadic and epidemic form. The resemblance between the two diseases is very pronounced in some epidemics, so that it is quite easy to understand why it should be called German measles by observers on the continent; and yet epidemics vary so greatly in intensity, and individual attacks are so very unlike in their individual symptoms, especially the rash, that it is not always easy to diagnose the disease when it is met. That rubella is clearly a distinct disease, though closely resembling rubola, and also closely akin in some respects to mild attacks of scarlet fever, is demonstrated by the fact that an attack of rotheln does not afford immunity from either of the diseases named, nor does their occurrence guard against an attack of rotheln.

Unlike measles, rubella may occur sporadically and not be succeeded by an epidemic. In this regard it is more like scarlet

fever; and yet the differences between it and the latter disease are far more pronounced than between rubella and measles. The rash is more like that of the latter ailment and very like mild cases of it. Many recent authors consider it a sort of hybrid between measles and scarlatina, the term being used to represent the mildest possible forms of measles and scarlet fever; but this idea is not finding favor among the most careful observers, who treat of rubella as quite as distinct a disease as either of the others, and deserving of altogether separate consideration. A peculiar feature, however, is that when either of these diseases is known to prevail and rubella is coexistently seen it partakes more fully of the nature of the disease prevailing at the time of its occurrence. And yet this thought is not applied to these diseases alone. Yellow fever, for instance, if prevailing epidemically, will so change the types of malarial and typhoidal fevers of its section as to make their diagnosis very confusing. So with whooping-cough and pneumonia, rheumatism and dengue fever, and many other diseases that might be mentioned as having relationships, to all appearances. Considering this thought it is not worth the while to denominate the ailment scarlatinal-rubella or the rubella of measles.

Children of all ages, and even adults, are liable to its attacks, but young children, those below five years of age, are most susceptible. Its period of incubation covers from one to three weeks, most cases developing about ten days after exposure. It begins suddenly, as a rule, lasts but a few days, and is not attended by fatality, nor is it likely to present the complications and sequelæ of measles and scarlet fever.

Symptoms and Course.—Beginning with headache, shiverings, and chilliness, intermingled with heat, it presents also some soreness of throat, aching of limbs, and general feelings of unrest and discomfort. Within twenty-four or thirty-six hours from the ushering in of the first noticeable symptoms the rash will begin to show. Sometimes its presence is the first symptom to attract attention, so light will have been the prodromal or invasion symptoms. The eruption is first observed upon the face and forehead, from which it spreads rapidly over the trunk and limbs. Or it may show simultaneously over almost the entire bodily surface within a few hours after appearing on the forehead and face. It is a papular eruption, the papules being smaller than those of measles, and the blotching or aggregation of papules not being so distinct. It is bright red in color, rather redder than measles and less so than the eruption of well-developed scarlet fever, and does not gather crescentically. Usually the eruption lasts five or six days, though there is but twenty-four or thirty-six hours of full efflorescence. In light cases it hardly develops on the surface before it begins to fade away, generally subsiding in consonance with the fever. In severe cases it amounts to a very distinct rash,

almost as rough as that of measles, and when desquamation occurs, as it does in nearly all cases, and more especially in severe ones, it is of the bran-like character of the measles scaling. If the rash be very pronounced it is correspondingly high-colored, and the typical rubella patient may be said to be as red as a lobster of pale dye.

A confusing symptom is the rubella sore throat. The pharynx is almost as deeply colored as in scarlatina, the tonsils are very red and swollen, and the throat gives pain upon swallowing. But there is absence of deposit on the pharyngeal walls or tonsils, unless tonsillitis be present at the same time, in which event the diagnosis will be more difficult. But the sore throat of rubella usually subsides in a few days, generally by the end of the second or third day, as the temperature subsides and the rash fades away. It often occurs a second time before the patient is fully convalescent, this second appearance of sore throat being so peculiarly characteristic as to certainly clear up the differential diagnosis where there has been doubt prior to its appearance.

The glandular involvement of rubella is of the superficial cervical and posterior auricular glands, rather than those of the anterior neck, and parotids. This occurs also in measles, but rubella does not affect the general glandular topography of the neck as does the former; and while its peculiar glandular affinities are not altogether diagnostic of the disease yet they aid in making up its picture, since anterior and lateral involvement belong more to measles and not at all to uncomplicated cases of rubella. Some authors have dwelt strongly on this posterior glandular enlargement as distinctively an attendant upon rubella, but others speak with equal positiveness of the existence of this symptom in measles.

On the whole, there should not be much trouble in determining the presence of rubella, taking the symptoms and general course of the disease carefully into consideration.

Diagnosis.—Besides the general course and symptomatology of rubella there are certain differential diagnostic points that may be considered to advantage. From the punctiform rash of scarlet fever it differs in being more like a general erythema, with more of roughness and papular appearance on the neck and backs of the hands and upper surface of the feet. The scarlet fever eruption, it will be remembered, is more diffuse and occurs in greatest intensity upon the upper part of the chest and neck, while rubella is seen most pronouncedly upon the face and forehead. Scarlet fever has the white line about the mouth and alae nasi, rubella has it not. Scarlet fever has a very rapid pulse, while rubella's pulse is rarely above an hundred and ten, and the temperature rarely exceeds above 102 degrees. Scarlet fever is ushered in most frequently with sudden vomiting; in rubella this symptom is not often

present. The desquamation is totally unlike, and if doubt has existed up to this stage it need be no longer present. From measles it is to be differentiated by the more pronounced catarrhal symptoms of the latter, its hoarse cough, the eruption in the mouth, the measley smell, and the character of eruption, that of rubella being less general, less confluent, and not crescentic in form. The presence of either disease in epidemic form in a community assists in forming a diagnosis; but it should not be forgotten that German measles is likely to prevail at the same time epidemics of scarlet fever and measles are on, and should it precede or follow visits of these diseases it may be difficult to judge between it and either of them, as the one takes the place of the other, it being sometimes quite difficult to determine between a pronounced case of rotheln and a mild case of measles or scarlatina. Needless anxiety and commotion may be created by calling rubella scarlet fever, and, on the other hand, error in the opposite direction may result in serious disaster.

Treatment—Prophylaxis is not necessary in rubella. But if the diagnosis is doubtful every precaution belonging to the management of the more severe eruptive fevers should be exercised. While perhaps directly transmissible yet rubella is so mild and so altogether free from serious complications or fatal issues that there seems to be no need of quarantine.

The medical treatment will be limited to the exhibition of a few remedies.

Acute, for the fever, headache, thirst, restlessness and sore throat of the initial stage, will often be all that is needed.

Belladonna may be called for if the pharynx be very sore, especially if dark and swollen, and if headache be severe, with throbbing temples, rush of blood to the head, flushed face and throbbing carotids marking the course of a given case. The *Belladonna* rash is rather of the smooth order, and is slow in making its appearance.

Ferrum phosphoricum suits cases not severe enough to call for *Acute*. In other words, it is a modified *Acute* case that needs this remedy.

Dulcamara will meet the aching of the back and limbs present in occasional cases, especially if there be acute coryza at the same time, or if as the coryza appears there is relief from the muscular soreness and aching.

Cantharis will relieve the itching of the desquamative stage and allay nervous irritation arising therefrom, especially if there be vesical irritation with it, as is the case frequently in all skin involvements.

Apis may be called for in edematous conditions of the throat, as also for glandular involvement accompanying sore throat, particularly if the mucous membrane is very dark and puffy, and if

there is stitching pain extending up to the ears and out into the parotid glands.

Hyoscyamus may be demanded by an exalted state of the nervous system arising from the irritation of the eruption. Occasionally this is exceedingly marked, and whether it occurs in rubella or measles *Hyoscyamus* will often allay it.

Beyond these remedies it will rarely if ever be necessary to go. In fact, *Aconite* alone, or *Aconite* and *Belladonna*, singly and as called for, will generally carry the rubella patient through his attack with the minimum amount of inconvenience and distress. Rarely *Gelsemium* or *Brionia* may be needed to assist in developing the eruption, and for individual cases and special patients almost any remedy in the materia medica may be found useful intercurrently.

The diet need not be changed from the simple, nutritious diet belonging to all mild ailments, and special care about the ventilation of the room, bathing, clothing, exercise, etc., is not demanded. Common sense will dictate a general course which will meet the necessities of this disease.

CHAPTER XXI.

WHOOPIING-COUGH.

General Considerations—Age—Etiology—Symptoms and Course—Complications—Typical Paroxysms—Vomiting—Hæmorrhages—Later Complications—Diagnosis—Prognosis—General Treatment—Prophylaxis—Medical Treatment.

General Considerations.—Whooping-cough is a contagious disease of childhood involving the respiratory mucous membrane and characterized by a convulsive paroxysmal cough occurring in rapid series, terminating usually in a crowing inspiration that gives the disease its name, it being marked by a long crowing or whooping sound. This characteristic sound is caused by the occurrence of a prolonged forcible inspiration through the glottis contracted by spasm. It is not always present, indeed rarely present in the early stages of a well marked attack of the disease.

Pertussis is one of the zymoses that occurs in epidemics appearing in a community at intervals of about two or three years. In very large centres of population it is generally endemic. It is another of the diseases of childhood one attack of which secures exemption from subsequent attacks. It is perhaps possible that a child may have whooping-cough twice, or that it may have been present in childhood and may again be present in later life.

but this is very unusual. It is not believed that it depends in any wise upon unsanitary conditions or unhygienic surroundings, for it prevails alike commonly among the poor and wealthy classes. It is not to be gainsaid that children in close stuffy quarters, and who are poorly nourished and subjects of the general constitutional effects of ill-ventilation suffer more severely from it and are more prone to its complications and sequelae than those better situated. It is also a fact that weakly, delicate children more readily contract the disease, and those of tuberculous parentage are apt to have it in its worst forms as well as to suffer from bronchitis and pneumonia as complications. It is one of the commoner diseases of childhood, not many children escaping it. It seems also to be more or less intimately associated with measles, when occurring epidemically, an epidemic of whooping-cough often being noticed to precede or follow the former disease. Whooping-cough occurs more generally in the cold months of winter or early spring, and its epidemics last usually two or three months. From the very nature of the disease epidemics occurring in the winter are more severe than those which come in summer.

Age.—Pertussis is a disease of the early years of child-life. More than half the cases occur before the sixth year, and it is rarely met with after the tenth or twelfth year. It is not very common during the nursing period, but a large number of cases occur in children between one and six years of age. After the sixth year the proportion decreases very rapidly. It is occasionally seen in adult life, though rarely. With infirm adults and especially in aged people it usually becomes a quite serious affection. When occurring among negroes or other dark-skinned races it is possessed of a considerable degree of mortality, and while not one of the most fatal illnesses of childhood, yet it is by no means a trifling disease. The mortality records of Chicago for 1893 gave 210 deaths from whooping-cough as against 234 from measles, 329 from scarlet fever, and 975 from diphtheria.

Etiology.—Whooping-cough is undoubtedly due to a specific contagion and so active and vital is the causative factor that nearly all children exposed to the disease contract it. It is more contagious during the height of the paroxysmal stage than at any other time but is contagious during any part of its course. It is held to be least so during the later days of its existence. Predisposing causes may be mentioned, as tuberculous tendency, rachitis, marasmus, and unusually foul and contracted sleeping apartments. As suggested, the presence of measles has a bearing upon it and predisposes to epidemics of this disease.

The nature of the poison is not yet settled. It is well understood that pertussis is a disturbance of the sympathetic nervous system, either the pneumogastric, phrenic, recurrent laryngeal or the sympathetic nerves of the medulla oblongata. By many it is

looked upon as simply a bronchial catarrh, but the manifest contagiousness of the disease, the fact that it occurs in epidemics, and that immunity from a second attack is proved to be secured by its occurrence seems to establish the fact that it is of bacterial origin. Several observers have discovered bacteria in the breath of whooping-cough children, and it has been claimed that there is always present in the sputum a micro-organism that is peculiar to this disease. One observer has been able to isolate and obtain cultures of a short, thick bacillus which he names *bacillus tussis convulsiva*. Experiments upon animals with micro-organisms have developed in them bronchial catarrh, thus seeming to confirm the thought that the specific germ of the disease has been found to be that described by the observer mentioned, Afanasjew. No matter whether of micro-organism origin or not, whooping cough is generally pronounced a neurosis and the paroxysmal nature of the cough, together with the final crowing inspiration, is, beyond doubt, the result of epiglottic and pharyngeal contraction through direct nervous irritation. The thought that the bronchial and tracheal glands are primarily the seat of the disease, and responsible for the special features presented by the cough, does not explain its peculiar spasmodic nature and the final crow that gives it its name. Among recent authors Whittaker insists most strongly upon the bacterial origin. He quotes a number of experimenters as having reached the conclusion that pertussis is a mycosis whose toxins have special action upon the nerve centres of the superior laryngeal and vagus, contending that the mycotic theory has displaced the neurotic.

Symptoms and Course.—Pertussis has, beyond doubt, a stage of incubation. This period covers about ten days as a rule, and is not attended by severe prodromal symptoms. The first manifestation of the oncoming of whooping-cough is the ushering in of a catarrhal stage. There is nothing especially characteristic about this, and it is unimportant as compared with the catarrhal stage of measles. Usually there will be symptoms of a moderate or severe cold, as sneezing, headache, coryza, itching of the nose, hoarseness and a distressing cough. After a few days the paroxysmal features of the cough will manifest themselves. The fever is not usually high, even during the commencement of the typical cough. The catarrhal stage usually lasts about ten days, and by the time the symptoms would have subsided were the case simply a severe cold the real paroxysmal stage will be ushered in.

The paroxysm of whooping-cough is peculiar. It comes with a feeling of apprehension or anxiety on the part of the child and the presence of pain or tightness in the region of the sternum, or with constriction of the larynx and an irresistible inclination to cough, which, however, the child struggles against as best it can. This feature of the case amounts almost to the manifestation of an aura,

or premonition; and if the case be a severe one and the child is already phthisically predisposed, in marked paroxysms of coughing it may manifest a dread that is really distressing to behold. It will clench its little hands, grasp a chair or table, firmly hold its breath, and resist with all its might the on-coming of a severe paroxysm. Occasionally the coughing spells will come on without warning, the child being taken so suddenly as to almost lose its breath in an instant.

The cough consists of a series of sharp, short, explosive efforts at expiration, following each other very rapidly without apparently any inspirations between them. These continue long enough to cause the surface to become cyanotic and the eyes injected and bulging; the tongue is protruded, saliva flows from the mouth and perspiration starts from every pore. This paroxysm will last several seconds, and in severe cases it seems that the child will suffocate in spite of everything, when, finally, the air is drawn forcibly into the lungs through a constricted glottis with one long, forcible effort, producing the peculiar crow or whoop before mentioned. During the coughing spells there may hang from the mouth long strings of bronchial mucus, and very often the contents of the stomach will also be forcibly ejected. Several of these paroxysms occur in quick succession until this expectoration ofropy mucus follows, when the child will usually get relief, its little system being completely relaxed and a map of exhaustion following. Sometimes this paroxysm will extend over a period of a number of minutes before relief is obtained, and in bad cases there may be considerable hemorrhage from the mouth and nose and involuntary escape of the contents of the bladder and bowels during the paroxysm; sometimes the conjunctiva will be the seat of the hemorrhagic effusions, and in many instances I have witnessed a good deal of supra-orbital and infra-orbital ecchymosis, and even slight hemorrhage from the ears during coughing spells, because of their severity. Attacks of coughing are usually excited by undue exertion, or suddenness of effort of any kind, and also by crying, sneezing, and very often by eating and drinking; so that in some cases delicate children suffer severely from lack of nourishment on account of the inability to take food. Sudden exposures to drafts of air, cold bathing of the face and hands, putting the feet on the cold floor, and exposure by becoming uncovered at night, are also excitants of spasms of coughing.

In the milder type of cases it is difficult to make an early diagnosis in the absence of early crowing inspirations, because of the similarity of whooping-cough in its early stages, and in milder cases, to ordinary bronchial catarrh. The bronchial secretion, however, is not usually so glairy and glutinous as that of whooping-cough. Furthermore, the bronchial expectoration occurs throughout the coughing spells and is sometimes expectorated,

even in very young children, while the secretion of whooping-cough occurs at the close of the paroxysms, hangs from the mouth in long strings and frequently causes vomiting.

Complications.—BRONCHITIS is the most common of the complications of whooping-cough and is usually present in children predisposed to lung complications. It may be of ordinary severity and attack only portions of the tubes, or, unfortunately, it may be a widespread bronchitis, eventually complicated by pneumonia. Its danger arises in the possibility of collapse of the finer air cells and consequent gradual asphyxiation.

TYPICAL PNEUMONIA is a rare complication, the very nature of the disease conducing rather to catarrhal affections of the bronchial membrane. In violent cases hemorrhage of the lungs is possible, but not at all frequent. Effusion in the pleural cavity sometimes occurs, and suppurative pleuritis has been known to follow. In one case occurring in my own practice repeated aspiration became necessary and, eventually, resection of a portion of a rib and antiseptic douching of the pleura had to be resorted to.

VOMITING may become a complication by being so persistent as to induce exhaustion. In children easily nauseated, if the paroxysms of cough set up vomiting, it is apt to occur with every coughing spell. There is marked anorexia and in severe cases complete loss of bodily strength, coated tongue, foul breath, and rejection of all solid foods, and vomiting of all liquids. The relaxation which ensues may be so severe as to induce diarrhea, even to involuntary discharges from the bowels, the patient becoming completely exhausted from the gastro-intestinal fires. There may be considerable rectal prolapse in very young children in connection with the coughing spells, and involuntary micturition is among the most common attendants upon severe cases.

HEMORRHAGES.—Besides nasal hemorrhages, which are not at all uncommon, there may be, as stated, occasional hemorrhages from the ears. Hemoptysis and hematemesis are present in extreme cases; however, these forms are not likely to be violent. The most dangerous form that hemorrhage can assume is that occurring in the brain from rupture of some small blood vessel, convulsions and violent cerebral symptoms following as the result of this disaster. Hemiplegia, blindness, deafness, partial or complete, and loss of speech are occasional results of cerebral hemorrhage. When these conditions follow an unusually violent paroxysm of cough it is more than likely that cerebral hemorrhage has occurred.

Whooping-cough is a very frequent complement of attacks of measles, and is also not infrequently associated with scarlet fever, chicken pox and diphtheria. It is difficult to explain this association of the infectious diseases of childhood, but it is a clinical fact that just as attacks of scarlet fever follow diphtheria, or occur

simultaneously with that disease, so also whooping-cough may be a complication or may follow any of the infectious diseases of childhood. When occurring with measles the prognosis is rendered more unfavorable, because of the tendency of the measles-eruption to affect the mucous membrane of the throat and lungs already attacked by the whooping-cough process. Croupous pneumonia, broncho-pneumonia, pleurisy, empyema and atelectasis are very much more likely to occur when measles and whooping-cough are associated than when they are present singly. As may easily be inferred, children phthisically predisposed may develop tuberculosis and never altogether recover from a severe attack of whooping-cough. Especially is this the case with the bronchial and tracheal glands, which become very much involved during the presence of pertussis. Various forms of paralysis, as blindness, deaf-mutism, aphasia, and even disseminated sclerosis, may follow whooping-cough in delicate children. The development of tuberculosis is very much more apt to be a sequel than a complication of the disease, and it may be one, two, three or four years before general tuberculosis traceable to whooping-cough may fairly start up its destructive processes. In rachitic children permanent chest deformity and even spinal curvature may ensue as a legacy of unusually severe whooping-cough. General atrophy and wasting occur as a sequence of severe intestinal complications. Many children will for years bear evidences of the severe shock their systems have suffered from pertussis.

Diagnosis.—It is sometimes very difficult to recognize whooping-cough and differentiate it from simple influenza or bronchial catarrh in its earlier stages. There is usually but little fever, and the paroxysmal nature of the cough is not an early symptom. If a child who has been perfectly well starts in with a series of rapid, sudden, expulsive coughs, it may readily be inferred that the disease is commencing; but in some cases the child will cough a week or two before the characteristic whoop is heard, and before there are sufficiently marked paroxysms of cough to justify the diagnosis. In occasional cases the cough occurs early, within a day or two of the commencement of the symptoms, and then the diagnosis is rendered certain from the start. In mild cases the child may go several weeks, passing through the mild form without developing the characterizing symptom at all, the diagnosis having to depend in this case upon the paroxysmal character of the cough, its harassing nature, the efforts of the child to resist it and to support itself against the paroxysms, together with the ejection of glairy, glassy,ropy mucus, and perhaps occasional attacks of vomiting. The prolonged expiration, followed by the long drawn, audible inspiration, the manifest constriction of the glottis, the cyanosis, and the desperate efforts of the child to hold itself against the paroxysm, will make the diagnosis clear.

Children who have been in bad health previous to the development of the cough, in whom there is some wasting, who have daily occurrence of fever and other hectic symptoms, and who present cough with imperfectly developed paroxysms extending over a long period of time, are likely to suffer from incipient tuberculosis. There is nothing characteristic about the fever of whooping-cough, though in some instances it may be quite marked. Vomiting, so often present in connection with whooping-cough, is not likely to attend the strictly tubercular cough, but may be an accompaniment of harassing bronchitis.

Prognosis.—Whooping-cough is possessed of a greater mortality than is generally supposed. Griffith records in the American Text-Book of Diseases of Children 120,000 deaths in England and Wales between 1858 and 1867, or about 13,000 deaths per annum, and 17,000 deaths per annum are quoted as occurring in Prussia from 1875 to 1880. Dolan says it is third among the fatal diseases of childhood in England. In Chicago about one-fourth as many children die of whooping-cough as diphtheria, and in this connection it may be stated that these figures do not include the list of deaths occurring from its complications and sequelæ, so that, as in measles, we are fully justified in impressing upon the profession the necessity of impressing, in turn, upon the people, the fact that whooping cough is a disease to be treated carefully from beginning to end, more especially in regard to its lung, intestinal and paralytic sequelæ. Its chiefest mortality is from bronchial complications in children under three years of age. After the fifth or sixth year it is not so likely to be attended by danger, excepting that in children predisposed to tuberculosis lung or intestinal complications are as likely to occur as in younger subjects. It is affected by seasons, the highest mortality occurring in the winter time. The second largest, perhaps, attends upon gastrointestinal complications occurring in hot weather. In these instances infantile marasmus very often develops considerable mortality, doubtless from chest tuberculosis.

Death may occasionally occur suddenly from suffocation due to violence of the cough, spasm of the glottis, and perhaps sudden collapse of the air cells. This latter is, doubtless, the most common cause of death in young children occurring during the active stage of pertussis. Broncho-pneumonia comes second in the list; cerebral, or other hemorrhages, third; general atrophy ranking fourth as a cause of death in active stages.

An unfavorable symptom is unusual frequency of the attacks of cough, the child hardly having time to recuperate from one severe paroxysm before another is on. Generally there is not more than a dozen to twenty of these paroxysms in twenty-four hours, but when double or treble that number occur the danger is correspondingly increased. The relative severity of paroxysms has

bearing also upon diagnosis. In occasional instances the child may die from rupture of blood-vessels in the brain or lungs, more especially the former, when the case is otherwise pursuing a favorable course. Naturally the development of any of the complications mentioned will justify giving to the case a guarded diagnosis, and the physician should always be careful not to promise too much when the disease occurs in young children predisposed to tuberculous or rachitic habit.

Treatment.—Prophylaxis applies naturally in whooping-cough to children not yet affected. For the safety of other children, especially those not enjoying good health, the whooping-cough child should be isolated, and this quarantine should extend also to adult members of the family who are apt to come in contact with other children, since the disease is more or less likely to be transmitted by third persons. Usually isolation is not practiced and many a child has been sacrificed in this regard. The quarantine should extend over a period of weeks, from the very moment that the cough is developed until there is no danger of contagion. It is safer even to remove delicate children from the house in which whooping-cough occurs, and to have them absent for a number of weeks. Meanwhile all the secretions from the throat, bronchial tubes and nasal membrane should be destroyed. No particle of sputum should be allowed to adhere to the walls, floor or furniture, so be breathed by other children perhaps weeks hence with disease- or death-producing results. Cloths, handkerchiefs, etc., which are used by pertussis patients should be burned, and all clothing, bedding, etc., soiled by them should be thoroughly sterilized, destroyed if necessary, as is better in severe cases, if there are delicate children in the family.

These instructions may seem redundant, as thousands of children have whooping-cough every year and suffer very little inconvenience therefrom, playing the while with their fellows and being in no sense deprived of their liberty; but doubtless a large share of mortality in this disease results from this very carelessness, exposure to a mild attack entailing a possible fatal one in the very next case developed therefrom.

MEDICATION.—Whooping-cough has for many years been held to be unamenable to medical treatment, and the old adage "Six weeks in and six weeks out," or three months of coughing, has been held to be the infliction of pertussis. And in so far as I have been able to observe this adage holds as good now under old school methods as it did twenty-five years ago. For in no single instance has the author known of real benefit accruing from the practices of the dominant sect, and in more than one instance has it been known that practitioners of that system have sent patients to homeopaths for treatment. In one instance I was called upon to carry the child of a well-known physician of the old school

through an attack of whooping-cough, the parent being prompted to try homoeopathic treatment because of the evident failure of his own methods and the manifest superiority of those of the new system. It is a stubborn disease, and very often the physician will be baffled in the effort to find and apply successfully the given simillimum. But patient investigation and painstaking effort to adapt the remedy to the case in hand, with reference to the patient rather than his ailment, will usually be rewarded by lighter paroxysms and briefer duration of the disease. At best it can only be shortened and made less severe with the gain of the additional advantage of warding off or modifying the severity of complications and sequelæ.

Aconite.—If fever be present, together with dryness of the membranes, thirst, restlessness, anxiety, peevishness, etc., *Aconite* will be found useful in this as in other diseases.

Belladonna may do better service when practically the same symptoms are present, if the characteristic constriction of the throat be present early. In fact, *Belladonna* is one of the very best remedies in whooping-cough. It has the suddenness of attack, the spasmodic feature of paroxysm, the constriction of throat and tightness of chest, the rush of blood to the face and neck, the cyanosis, clutching of the throat, or the clinging to the parent or nurse from fright or a sense of danger and dread, and meets a large share of cases in the early stage when these symptoms are present. Later it is usually valueless. But in the second or third week, or earlier, when the paroxysmal feature is marked and persistent, *Belladonna* will often give pronounced relief and shorten the attacks, modifying them the while.

Drosera has been used for a long time in homoeopathic practice, but I have not found it to be the approach to a "specific" that it is claimed to be by many. When the cough is hoarse, the crowing inspiration pronounced, the deep inspiration following severe paroxysms especially prolonged, the suffocative symptoms severe, *Drosera* may render valuable aid. But the routine prescribing of this or any other remedy is sure to be attended by disappointment. For whooping-cough differs in different children, just as any other disease differs. *Drosera's* cough is worse after midnight, is of a barking character, and, if expectoration is not easy, vomiting and retching ensue. The cough is so severe that during its height the child grasps and holds the hypochondrium. Paroxysms are excited by laughing, playing, or violent exercise. Ejection of strings of glairy, yellow mucus occurs.

Cervinum rubrum is another much-abused remedy. Someone suggested it some years ago for whooping-cough; ergo, it should be used indiscriminately. A guiding symptom for this remedy is smothering before the cough. In other words, the neurotic element is present in pronounced degree, and as a paroxysm

approaches there is constriction of the chest or spasm of the glottis, or both, and smothering occurs before the bark commences. The child will fairly gasp for breath and grow purple in the face, even before the coughing begins. When it commences there will usually be relief from the suffocation, though this may last during the paroxysm also, until the child is almost gone for want of breath. *Corallium* has this severity of suffocation very pronounced, but it is before the cough rather than during it and as the paroxysm closes. The larynx and trachea are more involved than the chest, and yet the crowing inspiration at the end of a paroxysm is not as pronounced as in *Drosera*, because of the time of the suffocation in relation to the paroxysm.

Spasmodica has more of a gagging cough, the explosions following in quick succession and being attended by profuse discharge of glairy mucus, vomiting resulting from its copiousness and tenacity. The child may become very much relaxed during the cough or it may be rigid and have spasms of the extensor muscles, becoming "as lax as a dish-rag" as the paroxysm passes off, and turning as pale as death, with cool sweat standing out in beads. This remedy will naturally be thought of and selected if there be excessive vomiting or other gastric disturbance. It is one of the most useful remedies in the materia medica in whooping-cough, and is likely to be called for at some stage of the disease in nearly every subject.

Mephitis has a peculiarly spasmodic cough. It is croupy, dry, explosive, constricting. The catarrhal symptoms are not well developed and there is little or no expectoration. The whistling or crowing inspiration is pronounced at the end of paroxysms of coughing, and as the cough comes on there is quite likely to be spasmodic constriction of the throat as with *Corallium*. *Mephitis* has been a disappointment to the author. Perhaps it has not been used high enough, but, barring an occasional success in modifying the severity of the spasms of coughing, its use has been very unsatisfactory.

Naphthalin in the lower attenuations has done better service for me than *Mephitis*, and is called for in about the conditions for which that remedy is prescribed. The paroxysms last longer than with most remedies, and the constriction of throat is very marked. The paroxysms come quickly, as with *Belladonna*, but do not terminate as suddenly, and last longer.

Nuxvomica, as might readily be supposed, is useful in whooping-cough with paroxysms amounting to spasms of the throat and chest, and deserves more frequent application in this disease. The cough is frequent, hard and dry. It comes on in the very early morning, and is then dry and hard, while later in the day, especially in the evening, it is attended by bloody expectoration. The usual *Nux* symptoms will be present in cases calling for it, as

constipation, headache, peevish disposition, anger, vehemence, torpid liver, etc. In fact, to do good work the case should be a typical *Nar* case throughout.

Rumex crispus covers dry, incessant, hacking, fatiguing cough present in marasmatic subjects, and is excited by a sensation of tickling under the sternum. There are pleuritic involvement, stitches in the chest and sides, hoarseness, uncertainty of voice, the cough being invariably aggravated by inhalations of cold air, and correspondingly ameliorated by the warmth of the room. The child will leave his outdoor play and run in the house, because of the aggravation of coughing spells from the cooler air of out-of-doors.

Hepar sulphur covers hoarse, croupy cough, worse as night comes on. The child is hoarse, and talks hoarsely and coughs hoarsely. Dull whistling in chest; aggravation of cough from inspiring cold air or from eating or drinking anything cold.

Kali bichromicum has a coarser cough than *Hepar*, and the croup is more of the "saw-board" kind. Discharge of long strings of tenacious mucus; discharge of thick yellow mucus from nose, worse after eating and from attempts at deep inspiration; child breathes rapidly and shallowly to prevent attacks of coughing. Glandular enlargement and general catarrhal involvement of nose, throat and frontal sinus.

Cuprum metallicum is specially indicated in convulsions attending whooping-cough. Long uninterrupted paroxysms lasting until the child is exhausted, and followed by extreme cyanosis and spasms of the flexors, especially. Farrington says it follows *Ipecacuanha* well, but the general symptoms are so unlike that I have not used it complementarily to that remedy. It is called for when the child is nervous, moving about restlessly in its sleep, starting suddenly in fits of coughing, which almost invariably end in convulsions, more or less severe, beginning at the fingers and toes, and oftentimes amounting to nothing more than cramping of those members. In other cases the spasms will be general and clonic in character, and attended with danger because of the spasmodic constriction of the chest and dangerous impediment to breathing.

Zincum is another metal to be thought of in spasms of whooping-cough. The restlessness is intense, and as paroxysms come on the child will grab anything at hand and hold on with all its might to steady and control itself; grasping at the genitals; involuntary passing of urine or feces; clutching of the hands and clinging to the nurse or parent.

Palatilla will be occasionally found very useful in the first stage, when the cough is loose from the start and gastric symptoms are marked. Vomiting of mucus at every fit of coughing. Child cries easily as cough approaches, or during or following the fit. Body and head hot with coldness of extremities; cough-

ing spells aggravated when extremities are cold or when exposed to draughts of cool air. All symptoms better from warmth. Suitable specially to bloated lymphatic children of tender disposition, and more especially to girls and effeminate boys.

Sambucus is another moist remedy. Cough attended with copious expectoration of mucus. Mucus tenacious, sweetish or salty, or having a putrid odor. Cough worse about midnight, and dry while sleeping, with copious discharge of mucus upon waking and coughing.

Sanguinaria corresponds to croup, along with *Kali bichromicum*, *Spongia* and *Ilepar*, whether given in whooping-cough or for croup proper. Cough of a croupy nature; worse upon waking from sleep; not relieved till patient sits up in bed and goes through a coughing spell of moderate severity, in which croupiness in character and dry hoarseness predominate. Sharp pains in the chest. Constipation, dry, hard cough. To be studied in connection with the presence of broncho-pneumonia as a complication.

Ambra grisea suits nervous cough, or cough excited by nervousness due to any excitement, as the presence of too many persons in the room, a tedious or unwelcome visitor, fretting about playthings or something to eat; child fidgety and crochety about trifles; cough excited by manifestations of nervousness of any kind. Cough hollow and barking, worse from talking or efforts to use the vocal cords. *Ambra* has been used as a prophylactic with perhaps moderate or questionable results. It is more specially adapted to the nervous child than to his disease, and when nervousness excites the cough it will be found among the more serviceable remedies.

Browaine is still another croupy cough remedy that must not be overlooked. Like *Corallinum* it has suffocation very pronounced. Spasm of the glottis, crampy, rough, barking cough, worse from motion, efforts at deep breathing, and from inhalations of vapor other than clear steam. Tobacco smoke, vapors from the kitchen, inhalations of fumes of any kind, aggravate the *Browaine* cough. It is hard and suffocative, and the throat feels cold. Sensation of inhaling cold air. Gasping for breath and chilliness with shivering of the body.

Coccus cacti is highly recommended for cough occurring immediately upon awakening, cough ending in vomiting, with strings of clear ropy mucus hanging from the child's mouth to the floor. Cough racks the whole system, and the head pains as if it would burst, so violent are the convulsions from the explosive character of the cough. Expectoration toward the close of the paroxysm, so free and yet so tenacious as to threaten strangling; protracted bronchial catarrh following whooping-cough. This remedy has not become a favorite with me, though highly recommended by Jousset.

Euphrasia may be called for in cases affecting the catarrhal membrane chiefly, with profuse lachrymation and coryza, cough present in daytime but not at night, the abundant watery secretions seeming to give relief from severe coughing spells.

Cina is suited to wormy children. By that is meant it is suited to children who have intestinal irritations from ascarides, with peevishness, fretfulness, irritability, obstinacy, and other mental characteristics belonging to *Cina*. The symptoms, except the cough, are attributable to the gastro-intestinal tract, as vomiting, itching of the anus, colicky pains, foulness of breath, coated tongue, dark circles under the eyes, paroxysms of cough increasing these and also intensifying the gastro-intestinal disturbances. If a child has threadworms and is attacked with whooping-cough, its coughing spells will be more frequent and severe, and the child will be made more miserable generally. It is well to prescribe *Cina* for whooping-cough in the characteristically *Cina* child.

Arnica has been found useful in my practice for cases in which the paroxysms were so severe as to cause ecchymosis and hemorrhage in the cellular tissue, hemorrhage of the conjunctiva and from the ears, with general violence of paroxysms, so violent, in fact, as to cause muscular rigidity and soreness; whole body feels bruised and lame from the exertion. The child has to catch hold of something hard or drops instantly to the floor, pressing his head against the floor or sidewalk to steady himself during an attack of coughing.

Spongia suits the hoarse, croupy cough of this remedy, with constriction of chest and throat, spasms of croupy cough, worse from cold air, better from eating and drinking. This symptom is not common to many remedies, and when the child attempts to ward off paroxysms of cough by eating something or repeatedly drinking water or other liquid *Spongia* should be thought of.

Baryta carbonica and *Baryta iodata* are useful in old people and marasmatic children with large tonsils, tickling in the throat, loss of voice, tonsils swelling and inflaming from slight cold. The *iodide* is especially useful in children predisposing to phthisis in whom tonsillar enlargement and mesenteric induration are present when the disease makes its appearance.

In addition to these a long list of remedies might be enumerated as useful in whooping-cough in occasional cases. *Badiaga*, *Veratrum album*, *Phosphorus*, *Scilla*, *Hyoscyamus*, *Ignatia*, *Laurustinus*, *Kreosotum*, *Nitric acid*, *Digitalis* and others may be called for in special instances. The thought is to select the remedy suited to the individual case, more especially with reference to its adaptability to the subject than to the disease in hand.

In lung complications *Bryonia* will naturally be thought of for dry, harsh cough, brownish expectoration, pneumonic dullness, dry or moist rales, hard cough giving pain with each ex-

plosion, pleuritic stitches and other *Bryonia* symptoms. Headaches upon motion or coughing, thirst for large quantities at a time, constipation, dry brown tongue and anorexia.

Tartar emeticus best suits cases with bronchitis, moist rales, cough sounds loose but expectoration is not pronounced; much rattling of mucus in chest and throat, with vomiting of mucus and food. Cough aggravated by anger, vehemence and irritability.

Phosphorus is applicable to cases threatening to end unfavorably, or to be long drawn out. Expectoration of tough, rust-colored or bright red and frothy phlegm, hoarseness, aphonia, tickling and titillating cough, constriction of chest with impending suffocation in later stages of the disease, after the paroxysms have ceased in severity. Case threatens to develop tuberculosis. Chest hollow, sunken, child emaciated and scrawny.

Iodum covers incipient phthisis. Consolidation at the apices. Hollow, spasmodic cough; tickling in the larynx and trachea; shortness of breath; aggravation upon exertion. Hunger without satisfaction from eating; commencing marasmus. No remedy will be found more useful, the symptoms suiting, than *Iodum* in cases threatening to run into rapid tuberculosis. It has emaciation, prostration, steady loss of strength, hacking cough, dry, shriveled skin, old, dirty look, hectic fever, anorexia, etc. *Iodum* has served me to better purpose than any single remedy in protracted cases of whooping-cough threatening general systemic involvement. I have favored the thirtieth and higher potencies.

Lycopodium also stands as a guard against systemic degeneration. It is suited especially to thin, tall, scrawny girls, complexion sallow, breath short and labored, atonic dyspepsia with constipation, persistent cough, dry, hollow, hectic in character. Flatulent distension of bowels, borborygmus, rattling of mucus in chest, distension after eating, and general gastric and pulmonary distress. Cough hacking, worse toward evening, sweat upon exertion, chilliness upon even slight exposure.

Sulfur.—A dose of a moderate attenuation at long intervals, as a constitutional or intercurrent remedy, in protracted cases tending toward the development of phthisis, will sometimes remove the dyscrasia causing the complication, and rapidly clear up the case.

Calcarea carbonica suits lymphatic children with glandular enlargement. Cold feet and hands, loss of appetite, clamminess of skin, face pale and sallow, phthisical tendency. Pot-bellied children with approaching marasmus, scurfy skin and suppuration of cervical glands.

CHAPTER XXII.

MUMPS.

General Considerations—Symptoms and Course—Complications—Diagnosis—Treatment—Topical Applications—Diet.

General Considerations.—Mumps is an infectious acute disease of childhood which has been known to the medical profession even since before the days of Hippocrates. It usually occurs in epidemics extending over a wide area of country, and as a rule is more frequent in spring. It has a stage of incubation covering two or three weeks, longer than most other infectious diseases. It is characterized by fever, headache, difficulty of swallowing, and its peculiar significant symptom, enlargement of the parotid glands, which are its anatomical seat.

While properly classified as a disease of childhood it is by no means limited to children, but is quite common among youths, and by no means uncommon among adults. Nurses attending children with mumps are frequently attacked by it. It is undoubtedly due to some specific cause, and attacks are almost certain to follow in susceptible subjects who are exposed to the breath and buccal excretions of parotitic children. It occurs occasionally in animals, especially dogs, and it may be carried to third persons, more particularly to children in adjoining hospital wards and those in adjacent rooms or neighboring homes.

Usually epidemics of mumps last but a few weeks, two or three months at most, or, occasionally, in individual epidemics, cases may drag throughout the greater part of a year. Without explicable cause it seems to have a fondness for camps, barracks and crowded quarters, it having been not infrequently known to inflict great suffering and inconvenience upon whole camps of soldiers. It is one of the diseases that seems to have a preference in the matter of sex, the stronger sex suffering far more frequently than the weaker. While it may attack at any age of life, nursing infants and very old people only being altogether exempt, yet it is very much more common in children of from two to ten years of age, and may, therefore, be classed as a disease belonging to early child-life. The younger the child, beyond the nursing period, the more susceptible it is to this disease, and a rather peculiar circumstance connected with a family where this disease is present is that it usually attacks the youngest child first, and, exposures being equal, other children come down in order of age, from younger to older. But few male persons escape attacks of

mumps at some time during life, careful observers estimating that above ninety per cent of the residents of residence-schools, barracks, asylums, etc., have been attacked in a single epidemic.

Etiology.—It is proved that the infective principle of parotitis is a micro-organism affecting the blood or developing toxins in the parotid glands, which, in turn, causes the inflammation and general constitutional symptoms peculiar to the disease. It seems to be definitely understood that the familiar local disturbances, developing in the mouth, arise from the inhalation of the specific germs or poison, generated in the buccal secretions and conveyed to the parotid glands through Steno's duct, setting up inflammation, headache, fever and other constitutional disturbances. While the taking of cold, enfeebled conditions of the system, general lymphatic habit, improper nourishment, and close, crowded quarters, unquestionably predispose to the attacks, it cannot be gainsaid that this very epidemicity, its certainty of contagiousness, the fact that it can be carried to third persons, and other like circumstances, go to prove that it is one of the diseases that has most likely a specific cause as yet not fully stated. It is claimed that Pasteur and other French investigators have found a special bacillus of an "S" or "V" shape, which has been termed *bacillus parotid*, and has been held responsible for the occurrence of mumps. A good many experiments have been made in the line of bacteriology, and it is now generally accepted that this special germ, which is of one to two or three one-thousandths of a millimetre in length, has to do with the cause of the disease.

Occasionally mumps may be caused by, or seem to be the result of traumatism, and just why an involvement of the parotid gland should follow upon injuries is not very difficult to understand. Effusion of blood in the parotid or surrounding tissues, or structural death, would naturally set up a septic process that would result in the inflammation of the parotid. It occasionally follows, also, upon injuries of the face, such as burns and scalds, and is not at all an uncommon accompaniment upon erysipelas and other inflammations of the facial derma. But these cases of parotitis are not the specific contagious mumps of childhood. The latter is strictly an infectious disease, and occurs very often in connection with whooping cough, measles, scarlet fever and diphtheria. One of the inexplicable phenomena in connection with the diseases of childhood is this peculiar association of them all, and it is not thought necessary to mention in this connection the multifold inflammations of the parotid gland arising during the course of protracted diseases, as pneumonia, typhoid fever, and general septic states. They properly belong to works on general practice.

Symptoms and Course.—While as a rule mumps sets in with a chill, or at least chilly sensations intermingled with heat, fever

arising quickly, that is, within the first twenty-four hours to 104° or 104½, or even higher yet, because of the long stage of incubation, constitutional disturbances consisting of malaise, debility, some disturbance of the gastric functions, as loss of appetite, thirst, coated tongue, foul breath, with, perhaps, increased salivation and headache, are apt to show early. These symptoms are not marked, as a rule, and yet may be quite pronounced in individual cases, presenting three or four days, or perhaps a week, prior to the recording of complaints about the throat and neck. The initial glandular symptoms usually follow quickly upon the chill and first positive elevation of the temperature. Lancinating pains are felt about the neck and jaws, and sometimes there is a sense of stiffness and pain upon attempting lateral motions of the neck. Attention is soon called to the parotid by the fulness appearing in this locality, and examination reveals enlargement and manifest tenderness upon touch. The glands swell quickly to considerable size so that the subject is completely deformed at the angle of the jaw, and soon protrude until they are even with the face and temples. When it has obtained the size of a large pecan or small walnut it causes general disfigurement of the face and neck, with no little interference with mastication. Deglutition becomes difficult, and speech is so interfered with as to be rendered quite indistinct. There is usually a great deal of pain in the ordinary parotitis, and in individual instances, especially in quite young children where the case is pronounced, the pain may be constant and really severe. It is generally of a sharp, lancinating character, extending to the jaws and up into the ears and temples. In order to secure as much relief as possible from relaxation of the muscles of the neck the little patient will hold its head toward the affected side, if but one side is involved, but the pain will cause it to cry and fret and worry until it is quite worn out. The pain of parotitis is usually very much aggravated by mastication and attempts at chewing or swallowing food, and when both sides are involved the suffering is intense. Coming up quickly the swelling usually reaches its height at about the fourth day, the increase in swelling and thermometric range being coincidental. The fever falls rapidly after the inflammation has reached its maximum degree, and by the sixth or eighth day will have completely subsided unless the gland on the opposite side take on the disease and the inflammatory process be repeated, in which event another week of trouble is on. In cases where both parotids are involved simultaneously the fever is more pronounced, the pain is much greater, the swelling is nearly or quite doubled, and the deformity is correspondingly marked. Sometimes neighboring glands take on the inflammatory process, in which event the neck will be a tumefied and indurated mass, the distortion of the features being considerable.

A marked error of the laity is the belief that the use of acids will increase the pain of mumps, and, therefore, the proverbial granny will suggest the use of vinegar as a domestic test. It is true that in some cases the use of sharp, sour drinks will intensify the pain of parotitis, but more often no such result follows their use, and, therefore, the test is a misleading one. As the inflammation subsides the temperature decreases, the swelling rapidly becomes less, and all symptoms decline so quickly that the last few days are quite at variance with the first few days of its development.

Complications.—While comparatively an insignificant disease in itself, mumps is by no means a trivial disorder since complications often ensue that cause a vast amount of pain and suffering, and sometimes resulting in glandular suppuration. The most common of these complications, and by far the most painful, is orchitis. The metastasis of mumps to the testicle is difficult to explain, but it is a common occurrence in this disease, especially in adults, and sometimes results in hydrocele and even extensive cellular inflammation and suppuration within the scrotum. This complication usually occurs suddenly and at the height of parotitis. Upon the first indication of soreness and enlargement of the genital gland the swelling of the parotid begins to subside, disappearing about as rapidly as the testicular enlargement progresses. In some instances the inflammation of the parotid may have disappeared, or comparatively so, and the involvement of the testicle present as a secondary trouble a day or two later. This organ will take on twice or even three or four times its normal size and become so exceedingly painful as to demand prompt measures for its relief. There will be fever, headache, thirst, restlessness, pain in the groins, lancinating up the spermatic cords, and general systemic disturbance, even more pronounced in many instances than during the primary disease. In part of the cases observed by the author the pain attendant upon orchitis occurring in connection with mumps has been agonizing, and the physical and mental distress about as pronounced as in the most painful diseases known to the profession. This complication is not likely to occur in young subjects, and when it does take place is usually not very painful. Generally but one gland is involved, the one corresponding to the side affected by mumps. A very peculiar circumstance lies in the fact that when both parotids are involved, if a metastasis occurs, the right testicle is the one to inflame. I have never observed orchitis in both glands and it is said that double orchitis is extremely rare. The liability of these complications seems to depend in no wise upon the severity of the original case, the most agonizing orchitis following the simplest possible case of mumps, and on the other hand the severest case of mumps occurring without any migration to other parts of the body. In real severe cases

of orchitis, besides the symptoms given, the pain may be so intense as to induce reflex vomiting and acute abdominal crampings, presumably from the solar plexus.

Other complications besides orchitis may occur. Occasionally in women the breast will become involved in cervical inflammation, not usually going on to suppuration, and in rare instances metastatic inflammation of the ovaries and uterus may occur. I have seen two very pronounced cases of ovaritis occurring after mumps, and from this cause, but have never met with a case involving the uterus. Still another complication may ensue. In case parotid suppuration results the ears may become involved in the process; partial or even complete deafness is not infrequently traceable to mumps. In adults, severe headache, violent cerebral congestion and often serious meningeal symptoms may occur. I have never met with a fatal case of mumps but have witnessed violent delirium a number of times, and in one instance temporary insanity, covering a period of more than two weeks, from no other appreciable cause and directly associated with an unusually severe case of parotitis. Fatal cases of the disease are recorded, from gangrene of the parotids; in severe epidemics abscesses of the cervical cords may occur, and occasionally paralysis of the lower extremities presents as a sequel. When this occurs it is not unlike the paralysis of diphtheria, assumed to depend upon peripheral neuritis and always resulting in recovery.

Diagnosis.—The diagnosis of mumps is not difficult. The swelling at the angle of the jaw, with severe lancinating pain extending to the ears and temples in many instances, the positive increase in size of the parotid gland, its pressure closing the mouth and elevating the lobe of the ear, causing some torsion of the neck, render it easy of recognition and differentiation from the throat swelling of tonsillitis, scarlet fever and diphtheria, though inspection of the throat alone usually suffices to make the diagnosis clear, the enlargement of the latter disease being primarily in the throat while in mumps the tonsils and pharyngeal walls are not involved. Besides, the parotid can generally be lifted by the fingers, and will be found enlarged, sore and indurated. It may be confounded with simple adenitis, but generally in the latter complaint there will be involvement of other glands besides the parotid, and there is not apt to be so much swelling or disfiguration, nor is the oncoming of the disease as abrupt. The prevalence of an epidemic of mumps will, of course, make the diagnosis very easy, and in glandular swelling arising from decaying teeth and inflammation of the gums the diagnosis will be determined by the localized soreness and inflammation immediately surrounding the teeth affected.

Treatment.—It is well to quarantine the mummy child from the time the symptoms first appear until the acute stage has sub-

sided, this being the stage of greatest activity of the inflammatory principle. It is such a simple disease that it is often difficult to secure isolation, and, really, it is only especially desirable that delicate children, those predisposed to scorbutic and tuberculous dyscrasie, be reasonably protected from liability to infection. As soon as the fever has subsided and the swelling begins to go down quarantine may be raised and the sick child may have its liberty with its play-fellows.

The medical treatment will consist of the application of remedies for the relief of pain and the prevention or cure of metastases. Naturally, in the acute febrile stage, with restlessness, thirst, hot, dry skin, quick, bounding pulse, headache, and rapid swelling of the parotids, *Acetate* will be found very useful. Its prompt exhibition will even materially modify and positively shorten the disease in its course.

Belladonna will be found beneficial in right side cases, with extensive swelling, throbbing headache, red face, and injected eyes, the pains occurring paroxysmally and being of a darting, lancinating character. If, with the swelling, there is a good deal of soreness of throat and difficulty of swallowing *Belladonna* will be found to be more than ever a useful remedy.

Pulsatilla is applicable to mumps in blonde children, especially girls, with swelling of both sides, and is also one of the best remedies for the orchitic complication. The pains are aching in character, extending up the cord, and reflex gastric disturbances are common.

Rhus tox. is especially useful in cases occurring in connection with or immediately following scarlatina. With parotitis and orchitis there will be a good deal of aching of the limbs and other *Rhus* symptoms.

Lycopodium is another remedy that will be found extremely useful in parotitis complicating scarlet fever. It is impossible in these cases to determine whether the enlargement of the glands is due to separate or mixed infection, or wholly due to a scarlet fever poison; but the treatment need not differ on this account. *Lycopodium* best suits in scrawny children of phthisical dyscrasie, with faulty digestion and positive glandular induration.

Clematis erecta is especially useful in orchitis. There are painful swelling and induration of the testicles. Swelling in the right half of the scrotum, which is thickened and enlarged. Sensitiveness of the right spermatic cord; testicles swell and are very sensitive; metastatic breast pains, with sensation of tightness. Pains greatly aggravated at night and with orchitis there will be a great deal of distress upon urinating. *Clematis* seems to have a special affinity for the testicles and mammae, and is suited to metastatic mastitis as well as to oophitis.

Mercurius may occasionally be called for in this disease, and in chronic induration of either the parotid or testicle *Silicio* will often be found very useful. If suppuration threatens to follow induration *Hepar sulphur* may be exhibited with benefit, hastening the termination of the case. *Calcaria carbonica* is oftentimes applicable in typical *Calcaria* children for greatly enlarged glands and long continued adenitis. *Arsenicum*, *Lachesis*, and *Kreosotum* may be found necessary in especially malignant cases tending to long suppuration and threatened gangrene.

Topical Applications.—These are usually useless. If the inflammation be unusually severe and the tension unusually great, hot fomentations, dry or moist, may give relief. *Hamamelis* or *Africa* may be used diluted in connection with the fomentations. If suppuration threatens flaxseed poultices are permissible and often aid in giving relief. Hot hops, moist, are to be thought of and are not very likely to interfere with the consequences of the internal remedies. In country practice the application of slices of fat bacon is very prevalent and at least does no harm. As stated, however, topical applications are of little avail and, furthermore, are generally quite a nuisance.

The orchitic complication is the most painful of all, and sometimes hot fomentations will have to be applied to the testicle. It should be supported so as not to drag upon the cord, and here bags of hot bran and hot hops will serve an excellent purpose. Should fomentations be necessary, it may be well to add to them the remedy being used internally, but in cruder strength. Common domestic applications are witch-hazel, the various proprietary liniments and landanum. I have found *Africa*, in weak dilution of the tincture, and *Calendula* and *Hamamelis* serviceable remedies when applied externally very hot. The testicle should be supported for some weeks after an acute orchitis, and there may be a considerable degree of induration lasting for a length of time and requiring the exhibition of the properly indicated remedy for some weeks or months. Should the case go on to suppuration, it must be treated on general surgical principles, as by free drainage and thorough antiseptics. Suppuration of the testicle itself is very rare, this process being usually confined to the connective tissues. Nor is the epididymis often involved either in the process of induration or suppuration.

Diet.—The diet will naturally have to be largely of liquids, especially during the height of the disease, owing to the inability of the child to masticate and swallow food. Even drinking is quite difficult at times, and for a day or two the little patient will be able to take but little nourishment.

CHAPTER XXIII.

VACCINIA.

General Considerations—Statistics—Objections—The Operation—Symptoms and Course—Complications—Treatment.

General Considerations.—Vaccinia, strictly speaking, is not necessarily a disease of child-life, but because of the fact that it is usually only in children that its manifestation may require the attention of a physician it is thought best to include it in diseases belonging to little folk and demanding consideration in this volume.

Idiopathically vaccinia or cow pox is a contagious, eruptive disease of cattle. It is characterized by the presence of papules, which subsequently develop into vesicles, appearing upon the udders and teats of cows and camels and other cattle. By inoculation of the lymph from the vesicle the disease is developed in man. Its inoculation may occur accidentally in dairies, and from camels in caravans by direct contact of the hands of the attendants upon the sore teats and udders of the camels. However, the disease especially fastens upon mankind from the witting inoculation of attenuated cow-pox virus for the purpose of preventing the presence of small-pox, so that vaccinia is ordinarily witnessed as a direct result of vaccination.

Vaccination was introduced in 1776 by Edward Jenner. The common belief existed at that time that dairy maids who had contracted cow pox in milking were not susceptible to small pox. Some years before Jenner's experiments individuals had attempted inoculation, but to Jenner belongs whatever of credit there may be in the introduction, if vaccination be accounted a successful procedure. As a matter of history it may be well to recite just here that it was on the fourteenth of May, 1796, that Jenner introduced from vesicles on the hands of Sarah Nelmes, a dairy maid, by means of two superficial incisions on the arms of a boy eight years of age, the specific virus of cow pox. It is stated that the disease ran its ordinary course in this boy, whose name was James Phipps, and that inoculation of him by the virus of small pox six weeks later failed to produce that disease. It is recorded that a number of children were treated by this same method soon thereafter without any of them contracting small pox, and it was not until 1798, about two years after his first experiments, that Jenner made public the results of his inquiries. The medical world generally has accepted the practice of vaccination as a preventive of small pox, but the question is by no means a settled one.

Statistics.—The burden of testimony seems to be in favor of the Jennerian custom, for statistics show that in Sweden the mortality from small pox in the twenty-four years preceding the introduction of vaccination was two thousand and fifty for every million inhabitants, while after the introduction the mortality rate was reduced to one hundred and fifty eight per every million. In Berlin the mortality during the epidemic of 1872 and 1873 was respectively two hundred and forty-three and two hundred and sixty-two for every nine hundred thousand inhabitants. Vaccination was then made compulsory from the first year of life up to the twelfth year, with the result that the mortality was reduced until in 1883 the average death rate was 1.7 for every one hundred thousand. It is officially reported that during the epidemic in Sheffield, England, in 1887 and 1888, vaccinated children had a twenty-fold immunity against small pox as compared with unvaccinated children, and that the death rate among vaccinated children was but one against four hundred and eighty deaths among unvaccinated children.

Governmental reports show that during the Franco-German war of 1870 and 1871 the mortality of the soldiers of the French army, the unvaccinated, was 23,469, while that of the vaccinated German army was 261. From 1874 to 1890 there was reported but one single death in the German army of more than one-quarter of a million soldiers, vaccination and revaccination being a governmental procedure in that country.

From these figures it would seem that vaccination rightly and scientifically practiced affords almost certain immunity from death from small pox. Even the most ardent vaccinationist does not hold, however, that this process is an absolute quarantine against the disease. Small pox may occur in even recently vaccinated subjects, but when this happens, if real vaccinia has resulted from the vaccination, the disease occurs in modified form and, it may be said, is never fatal. The prophylactic influences of vaccination last in the human system but a few years at best, and just here lies the danger arising from the procedure. Persons once scientifically vaccinated are apt to neglect revaccination, at least until an epidemic of small pox is on, with the result that the disease is very often known to exist in subjects bearing undoubted vaccination scars; and from this fact anti-vaccinationists argue the failure of vaccination as a preventive of small pox, whereas the failure lies simply in the fact that the protective influence of vaccination has been lost by time. Certainly, to be protected against small pox it is necessary that vaccination be repeated every few years, especially in early life.

Thorne, the great English sanitarian, puts it that one successful vaccination in adults is permanently protective against death by and almost certainly protective against attacks of small pox.

even in its most modified form, but he also emphatically holds that in order to be protected vaccination should be repeated every six or seven years up to the age of thirty, and he further holds that no statistics bearing for or against the efficiency of its practice are worthy of consideration, except as they conform to the facts just stated. No believer in vaccination who has studied the subject carefully holds today that vaccination lasts a lifetime, and all observers full well understand that a great many alleged vaccinations are not vaccinations at all. No vaccination may be stated to be successful unless vaccinia fever has followed upon the introduction of the poison into the system.

Objections to the Jennerian practice are made by anti-vaccinationists on the grounds that it is exceedingly unsanitary to wilfully introduce into the human system any poison, and upon the additional grounds that such introduction has been known to develop constitutional diseases in individual cases, profound and destructive in character; but the danger of directly inoculating an innocent child with a disease most foul is, perhaps, more fancied than real, especially since inoculation through the virus of the human vaccinia pustule is abandoned and bovine virus has been resorted to.

It is hardly within the province of a work of this character to discuss in extenso the relative merits or demerits of vaccination. It is the individual belief of the author that vaccination properly performed, under strict asepsis, with perfectly pure bovine virus, is not only a justifiable procedure but one positively demanded in the interest of public health. It is not believed that the long chain of diseases enumerated by anti-vaccinationists is at all likely to be due to the practice of vaccination. At most it is believed that whatever of danger attends the procedure lies in the possibility of developing mild septicæmia. Naturally it can be easily understood that vaccination from tuberculous cattle or heifers afflicted with any of the diseases of kine would be an extremely unsanitary performance, one that cannot be too severely condemned, and, therefore, it is my firm conviction that all vaccine farms should be placed under the immediate supervision of authoritative health boards and that the greatest degree of caution should be exercised toward the propagation of perfectly pure lymph. It may be held that it is an impossibility to obtain lymph deserving of this classification, but to my mind this construction is strained and I feel sure that whatever of damage has been witnessed in my own experience, covering a period of more than twenty years, from vaccination, has been because the operation was carelessly performed, or has arisen from the use of impure virus.

Even admitting that there may be an element of danger in the practice, it is comparatively insignificant as compared with the

danger of the disease that it certainly modifies and absolutely prevents in such a large proportion of cases; and until other and more reliable testimony bearing against the practice shall have been adduced by its opponents I shall continue to advocate the performance of vaccination and revaccination with the purest virus obtainable and with as great a degree of surgical care as though a more important operation were about to be performed.

The figures compiled by Thorne tell a story of the virtue of vaccination that is not easily contradicted. From 1847 to 1853 vaccination was optional in England and during that time there were 1,617 deaths per million inhabitants between the ages of one to five years. From 1854 to 1871, during which time vaccination was obligatory but the law was not enforced, the deaths per million inhabitants occurring during the first five years of life were reduced to 817. From 1872 to 1878, when the law was still better enforced, 226 deaths for every million inhabitants between the first and fifth years of life occurred; while from 1878 to 1887, when vaccination was obligatory and the laws were rigorously enforced the deaths during the first five years of life were reduced to ninety-four for every million of people. Thus it will be seen that as against optional vaccination with a loss of 1,617 for each million the ratio was reduced with obligatory vaccination to ninety-four for every one million; so that seventeen times as many deaths occurred during the first five years of life when vaccination was optional as occurred during the same period of child-life when vaccination laws were rigorously enforced. Nor can it be held that these results are altogether due to improved sanitation. For instance, during the Sheffield epidemic to every child between one and five years of age who was vaccinated and who died there were an even eleven hundred deaths among unvaccinated children of like years; whereas, the record goes to show that where the sanitary surroundings of the subjects were exactly the same, that is, where children were living in large numbers in tenement houses in the same surroundings, for every child under five years who had been vaccinated and who died, eight hundred and fifty-eight unvaccinated subjects of the same years died from small pox. Surely, if sanitary surroundings alone had to do with the large fatality from small pox, and if vaccination were not in itself protective, there would be no such wide discrepancy in figures as is shown in this ratio of one to eight hundred and fifty-eight.

The Operation.—The simpler the procedure the better. The site selected is usually upon the outer side of the arm at a point not too near the shoulder joint. The field of operation should be thoroughly washed with soap and water and afterwards with sterilized water, and if the arm be oily and the skin rough and scaly exceeding care should be taken to secure cleanliness of the site by rubbing it briskly with sulphuric ether. This may

sound surgical and unnecessary, but no physician can free himself from the responsibility of the septic sore unless he shall have exercised this degree of caution at least.

The more unwholesome the subject the greater should be the care exhibited. Having thus carefully prepared the site, the ivory or bone point charged with the virus should be dipped in cold water, which has been previously boiled and cooled in a closed vessel or vial, for the purpose of softening the lymph on its tip. When this is softened to a mucilaginous state a few quick sharp incisions with its point should be made in the perpendicular axis of the arm just through the epidermis without exciting a flow of blood. Its area in very young children need not be larger than a pea. In older subjects it may be well to scarify an area as large as a silver half dime. When proper scarification has been done the abraded surface should look red and glossy, and a drop of clear lymph or serum will be thrown out of the wound. This should be removed by a pledget of sterilized gauze, unchemicalized, for if allowed to remain the serum will interfere with the introduction of the virus. Putting the scarifications upon the stretch by drawing the skin of the arm tightly and transversely the flattened point charged with virus should be freely applied by rubbing it over the wound while the lymph is moist, the wound being freed of blood and serum in order that the virus may be absorbed. The wound should then be allowed to dry and be lightly covered with sterilized gauze, in order that no atmospheric impurities may contaminate it. It takes less



FIG. 28.



FIG. 29.

time to perform vaccination on resisting children and adults than is necessary for the proper description of the procedure.

Many operators make cross scarifications in the cut. Others prefer to use the dried lymph, making the incision sufficiently

free to introduce a small portion of the crust therein. Many mechanical devices have been invented for the performance of vaccination, and numerous methods have been practiced; but the simple one just described answers the purpose and its very simplicity insures its general favor. It is not believed necessary, therefore, to enter into extensive description of other methods in this connection.

The practice of operating upon a large number of subjects in unsanitary public offices without previous preparation of either the patient or the surroundings cannot be too severely condemned. Severe illnesses have been known to follow upon carelessly performed vaccinations, and even fatal issues have resulted from what might be termed almost criminal carelessness in methods.

Symptoms and Course.—Vaccinia presents a clearly defined course, as much so as most infantile diseases. Within about seventy-two hours after the performance of vaccination the young child will show some symptoms of general malaise, as headache, lassitude, heaviness of the eyes, peevishness and indisposition to play as usual. Co-incidental with these symptoms, which are almost invariably present in young subjects, but which may be altogether absent in older persons, there will be observed a papular elevation at the edges of the scarification or in its immediate vicinity. This gradually enlarges until it shows as a defined pock or vesicle corresponding in size with the scarification. Sometimes quite a number of papules with vesicular apices will show for a space of an inch or more around the sore, with appearance very much like the pocks of varicella. By the fifth or sixth day the papula will have become a positive vesicle or reticulated sac. It presents an areola and redness of varying hue; this sometimes extends almost to the elbow, involving an area of some inches square. By the seventh or eighth day the vesicle which has by this time come up will have reached its maximum size, and will be seen to be of a bluish-white color with sharply defined edges and positive umbilication in the centre. The vesicle is filled with an opaque lymph which subsequently becomes pus, and which by the tenth day will have changed to a clear yellow. If the dry crust which now begins to form over the shriveled epidermis is harshly disturbed there is apt to be left an open sore, and if it is befouled by scratching or the introduction of dirt from the clothing or other cause, or if the child's system be in a very unwholesome state, it may remain an open sore for many weeks. In the natural course, however, this pustule dries and forms into a dry, scurfy mass by the twelfth or fifteenth day. By the end of the third week this dry crust will be shed, leaving a characteristic pit or sharply defined depression in the skin at the site of the pustule whiter than the surrounding integument. No vaccination is a successful vaccination that does not leave the characteristic vaccinia pock-mark.

During the time that this process has been going on there will be present more or less of constitutional symptoms. In some instances the headache is severe, and the temperature will rise from two to four or five degrees. In individual cases there is sore throat, enlargement and soreness of the glands of the axilla and the glands of the neck, and an intermingling of heat and chilliness amounting to rigors; in susceptible children there may even be moderate delirium during the height of the fever. The arm will inflame and become very sore at and surrounding the site of the wound, the local cellulitis being sometimes pronounced. A typical



FIG. 30.
VACCINIA ERYTHEMA.

typical vaccinia fever and eruption does not materially differ in its course from the simpler fevers of childhood, and if any of the constitutional dyscrasie exist in the system, or should the virus be in any wise impure, or the operation performed under septic conditions, gemine septic fever, lasting over a period of some days, may set up and give cause for considerable concern, in which cases vaccinia erythema may present over the entire body. I have witnessed in individual instances an erythematous rash so plentiful as to completely mottle the integument, though usually this erythema occurs in patches or blotches, more plentiful over the chest and back.

The constitutional symptoms usually subside with the development of the vesicle. In perhaps the larger number of cases they are not so severe as to interfere materially with the comfort or habits of the subject, and will require little if anything in the way of treatment.

Complications.—Erysipelas is perhaps the most common of the complications of vaccinia, but since it is so well understood that this disease is due to the introduction of its own cocci it is not likely to present except as introduced from without; unless from septic vaccination or auto-infection erysipelatous inflammation be set up. When occurring it runs about the usual course common to the simpler form of the disease. Vaccination should not be performed when erysipelas exists in a family, school or hospital, nor should it be done by a physician or surgeon having in charge

an erysipelas patient; and it ought to go without saying that the same caution applies to all of the infectious diseases.

Adenitis is a frequent complication of vaccinia, and few cases of really severe vaccinia escape inflammation of the glands of the axilla and neck. I have never witnessed a case going on to suppuration, and generally with the subsidence of the fever and inflammation about the sore the adenitis will disappear.

In some cases attended by sepsis, especially auto-infection, boils, abscesses and suppurating pimples occur for quite a period of time, especially in rachitic children and tuberculous subjects. It is held also, and the author can confirm the correctness of the claim, that children suffering from eczema, tetter and other skin diseases will suffer aggravations of these eruptions during and subsequent to the presence of vaccinia fever. In some instances these aggravations are very pronounced, sufficiently so to require medical treatment covering a period of time. In numerous instances, however, I have witnessed the entire clearing up of ailments of this character, and even of constitutional dyscrasie, as the result of vaccination.

Syphilis has undoubtedly been contracted through this cause, but only and always by inoculation by syphilitic virus direct from the pustule of a syphilitic subject. Thorne holds, and I believe correctly, that the one evidence of the introduction of this disease in this manner is the positive existence of a chancre at the site of the operation or in its immediate vicinity. Anti-vaccinationists charge a good many sins to vaccination that do not belong to it. No syphilographer will agree for one minute that it is possible to communicate this disease in secondary or tertiary form by vaccination, and should the disease in either of these forms follow upon its practice it may be held as a certainty that it is simply a co-incidence, and that the disease rested in the subject rather than in the virus. Even should its development follow upon vaccination no complaint against the procedure should be allowed to hold in this connection; for it is far better that any constitutional taint lying dormant in the system be driven to the surface, and be recognized, and treated, than to remain undiscovered only to mask and complicate other ailments to which the individual is liable.

Without attempting, therefore, to settle the question for others, the author is never disappointed should syphilis in integumentary form follow upon the proper performance of vaccination; the superficial presence of the disease believed to be a curse is often a blessing instead, and the "driving out" process is one of the most beneficial results of vaccination in some of the constitutional diseases of child-life.

Treatment.—True vaccinia fever in the simpler varieties will require little if any medical treatment, but, as may be inferred, pronounced cases of this disease may demand careful medication.

Aconite will be called for in the acute febrile stage when there is full, bounding pulse, headache, elevated temperature, thirst and restlessness.

Gelsemium or *Ferrum phosphoricum* may be needed in cases in which the fever is not as high as with *Aconite*, the type of cases calling for either of these remedies not being so intensely acute in febrile manifestations as with *Aconite*. *Gelsemium* has more of aching of the back and limbs, with headache in the back of the head, and pain in the back of the neck.

Belladonna suits cases characterized by the congestive type of headache, with dryness and constriction of the throat, and enlargement of the glands of the neck and axilla, with pain and swelling of the arm about the site of the wound, the case threatening to assume an erysipelatous character. *Belladonna* has less of intermingling of chill and heat than *Aconite*, less of shiverings, chilliness and shudderings. It also has a severer headache, and the symptoms are generally more lasting than those calling for *Aconite*. It is hardly likely that other remedies than these will be demanded in the febrile stage. For the general erythema of unusual cases no better remedy is to be had than *Belladonna*, unless, perchance, the burning, biting-itching may be intense, in which event either *Cantharis* or *Urtica urens* may be needed.

Rhus tox. may be found useful in cases assuming an erysipelatous form where the usual *Rhus* symptoms, as intense aching, nightly aggravations, excessive restlessness, and muttering delirium exist.

Apis has rendered good service in cases characterized by much glandular inflammation, with extensive redness and puffiness of the arm for some distance away from and surrounding the sore.

When pustulation occurs with an open sore from forcible removal of the crust, *Hepar* may be used to promote healing and healthy suppuration. For nausea, vomiting and other gastric symptoms that occasionally present, *Pulsatilla*, *Antimonium crudum* and *Ipecac* may occasionally be called for.

The open sore following too early removal of the crust had best be treated dry as a rule, being covered with sterilized gauze or lint. Vaseline and other petroleum preparations are usually irritating. Calendula oil makes a nice dressing, and applied on lint is to be preferred should any external application be required. The usual surgical principles should govern in the treatment of this condition.

Thuja will be found an excellent remedy for the secondary sores and unhealthy states of the skin that follow upon faulty vaccination; especially if the child be syphilitic or psoric and the indications point to the grafting of one of these dyscrasias upon the other, or the development in the child of symptoms which belong to the sycoitic state, this remedy will be called for. It has

done me best service in clearing up the taints that follow upon vaccination, whether the result of impure virus or but the lighting up of a dyscratic eruption. It should be administered in the thirtieth potency or higher.

CHAPTER XXIV.

VARICELLA.

General Considerations—Symptoms and Course—Differential Diagnosis—Prognosis—Treatment.

General Considerations.—Chicken pox is comparatively an insignificant disease. It rarely appears as an epidemic, but occurs endemically almost always in connection with small pox. Occasional sporadic cases are met with. It is one of the infectious diseases of childhood which runs a distinct course, and one attack affords immunity from subsequent attacks. It presents a period of incubation extending from twelve to fourteen days, generally about two weeks, but occasionally this stage occupies a much shorter period of time. It was formerly thought that there was a direct association between varicella and variola, but this opinion is no longer held. The only association between the two diseases now recognized lies in their occasional simultaneous occurrence. It is unquestionably due to its own specific virus. Various observers claim to have found a micrococcus in the vesicles, a parasite presenting an amoeboid and cystic stage and a stage of spore development, and after this a return to the amoeboid stage. This micro-organism has not responded to cultivation; in fact it may be doubted whether it possesses a really distinct and separate existence. The name, chicken pox, see colored plate, arises from the fact that the vesicles resemble in size the chick-pea, and it is well to remember that it is not so named because of its being a disease of the domestic fowl.

Few children who are susceptible to the influence of this disease, that is, children who have not already had it, escape it. It belongs especially to the early years of child-life, affecting babies at the breast, and children of from two to five years. It is rarely met with after the eighth or tenth year, although occasionally presenting in youth.

Unlike measles and mumps it is not at all likely to occur in adult life, even in adults who escaped it when children. It rarely presents a prodromal stage, the first manifestations generally consisting of headache, occasional slight fever, with gastric disturbances and prompt presence of the eruption. Oftener the appearance of

individual vesicles about the roots of the hair and on the back are the first evidences of the on-coming of the disease. In exceptional cases there may be slight chilliness intermingled with hot flashes, some headache, peevishness, thirst and general unrest; the symptoms appear, perhaps, twenty-four hours prior to the presence of the disease upon the skin.

Symptoms and Course.—Cases presenting with the incubation or prodromal symptoms just mentioned will have a moderate fever ranging from $99\frac{1}{2}^{\circ}$ to 102° or $102\frac{1}{2}^{\circ}$. In very rare instances the temperature

following a stage of positive chilliness will climb to 104° . The headache will be quite severe and the child will suffer correspondingly, being quite indisposed for a few hours. The eruption follows promptly upon the elevation of the temperature, and its crop will show perfect development within a few hours. One of its distinguishing features is that the eruption occurs in successive crops, the first efflorescence having hardly obtained its maximum until the second will begin, and so on through three or four



FIG. 31.

crops of vesicles. Its vesicles are abundantly scattered over the body, more profusely on the back and forehead, and each consists of a body or base and an apex or vesicle. The body of the pock varies in size from a pinhead to a split pea. It is ovoid in form, the skin is reddened at its base, and immediately preceding the development of the vesicle presents as a small hyperemic spot not unlike the individual spot of roseola. The vesicle appearing at the top of the pock is one-celled and filled with a clear lymph, which, as it dries, causes the convexity of large pocks to collapse and the apex to become concave, this occurring usually within a few hours after its appearance. The chicken pock is very superficial, lifting up only the superficial layer of the epidermis. Occasionally, however, the inflammation penetrates more deeply and then there will be pitting, as in small-pox, at the site of individual pocks. This pitting is more likely to occur on the forehead and cheeks than elsewhere. The eruption in general is much more prevalent on the back and breast. It also occurs about the wrist and ankles and smaller joints of the hands and feet.

Allowing twenty-four hours for the infection stage and from twenty-four to thirty-six hours for the eruption in its various crops, the whole course of the disease lasts over a period of from eight to twelve days. The eruption never becomes confluent, but sometimes two or three pocks will be run together by scratching and then there may be developed quite an ugly sore. There are no sequelæ or complications to this disease, and it is essentially one of the unimportant diseases of childhood, its only significance lying in the possibility of confusing it with small pox. This mistake has often occurred and is especially likely to happen during the prevalence of small pox. It may be well perhaps to state just here that occasionally in delicate, ill-nourished children of rachitic habit or syphilitic dyscrasia the pock sores, especially about the face, may become quite gangrenous. English authors speak of occasionally fatal cases under these conditions, but it is not likely that the seriousness of such a situation is due alone to varicella.

Differential Diagnosis.—As already stated, it is possible to confound varicella with variola, but the points of difference between the two diseases are very marked and only in exceptional cases is there excuse for confusion. Tersely stated, varicella presents the following characteristics: It occurs only in infants and very young children; its invasion is short and constitutional symptoms insignificant; the eruption is very superficial, never hard and nodular, and presents its vesicles almost at the very start; these vesicles are always one-celled, never partitioned, never confluent, nor do they aggregate over the face, hands, and feet; umbilication is exceedingly rare and belongs only to the larger pocks; the disease is altogether uninfluenced by vaccination of previous attacks of small pox.

On the other hand, small pox begins usually with very severe general symptoms, as intense headache, excruciating backache, and general soreness of the body and limbs; it affects all ages and, instead of the eruption developing very quickly it is deep-seated, affects the deeper structures of the skin, and is hard and shiny; the vesicles are usually multilocular and occur with greater prevalence on the face and hands and feet; they are usually confluent and pustulation is never absent; umbilication or pitting of the vesicle is invariably present, and, besides, there is an odor to small pox that is a very distinguishing feature once it is appreciated.

Thus it will be seen that there need be but little difficulty in diagnosing between varicella and variola; but it is to be remembered that varioloid or modified small pox does not present as positive a picture as the true disease, and painstaking care will have to be exercised in individual cases to avoid confusion. But the mildest case of varioloid is more severe in its constitutional symptoms than the severest case of varicella. Furthermore, varioloid is not apt to present at all in young children, for if vaccina-

tion has not been practiced the severe form of the disease will reveal itself, whereas if vaccination has been practiced in young subjects they are not likely to be attacked by small pox at all, since it is well understood that the milder form of small pox does not occur in vaccinated subjects until some years after its performance.

Prognosis.—The prognosis is always favorable. Complicated by scarlet fever, syphilis or tuberculosis, it may pursue an unfavorable course, but should such complications exist and fatality occur, the result must be charged to the severer disease which has only been lighted up by the chicken pox. The presence of chicken pox in a child does not protect it from small pox, and should the two epidemics prevail at the same time it must be remembered that it is possible for variola to develop in a varicella patient, and in the event of a fatal issue in such a case the death, of course, belongs to small pox. Varicella is perfectly free from complications or sequelæ.

Treatment.—In the way of prophylaxis it is best to have the chicken pox child taken from school and kept under surveillance. Complete isolation is not necessary except, perhaps, in cases manifesting the gangrenous form of the disease, which in the author's judgment is likely to exist more in the imagination than as a reality. Nourishing food, plenty of fresh air, freedom from bathing during the vesicular stage, and common-sense control of the patient, are all that will be required. Cooling drinks are grateful if the fever is pronounced. Should individual vesicles be large and show a tendency to umbilicate on the forehead and face, pitting may be prevented by the application of three parts of glycerine and one of carbolic acid, otherwise no local application is necessary.

Aconite should be given in the febrile stage when its well known symptoms are present; *Belladonna* if the headache be severe and the eruption a little slow in developing, with purplishness of the skin and tendency to irritation; *Pulsatilla* if there is much disturbance of the stomach, with nausea and nervous instability, peevishness, tearfulness, etc. Should there be considerable involvement of the glands, as occasionally occurs, *Calceola caroliniana* and *Silicia* are to be thought of. *Sulphur* may be demanded in a *Sulphur* child if there be a tendency toward the vesicles remaining as open sores. Should there be a good deal of itching of the eruption *Cantharis* may be serviceable, and if there be nightly aggravation of all the symptoms *Rhus tox.* will serve a good purpose. As a rule there will be no need for medication for more than one or two days, and I have rarely found it necessary to go beyond *Aconite*, *Belladonna* and *Pulsatilla*, singly, in the treatment of chicken pox.

CHAPTER XXV.

VARIOLA.

General Considerations—Etiology—Symptoms and Course—Eruptive Stage—Desiccation—Confluent Small-Pox—Hemorrhagic Variety—Varioloid—Complications and Sequela—Diagnosis—Prognosis—Prophylaxis—Care of the Patient—Pitting—Treatment.

General Considerations.—Small-pox is not properly a disease of childhood and therefore will not be considered in extenso in this volume. Prior to the introduction of vaccination it deserved classification with children's diseases, as much so as any of the infectious disorders that attack children by preference but that occur in other ages as well; for it was the rule for small-pox to occur in children before Jenner's day, just as it is for measles to attack young children in the present age. Older authors formerly described this disease under the name of *kinderpocken*, its name indicating that it was then looked upon as a child's pox.

It doesn't differ essentially in children and adults, the symptoms being practically the same at all ages, excepting, perhaps, that the bodily and spinal pains and headache will be more severe in adults, while the eruptive symptoms present somewhat earlier in children.

Variola is an acute infectious disease characterized by a peculiar eruption and profound constitutional disturbances. Its onset is sudden and violent, and is usually ushered in by a severe chill, excruciating pains in the small of the back, very severe headache and chilliness, soon followed by high fever. It is not only the most loathsome of all the infectious diseases, but when occurring in children is attended by a high mortality rate. The different sexes are about equally affected, but the disease has a peculiar affinity for copper-colored races. It has a large mortality among the negroes; and a much greater mortality among Mexicans and Indians. The disease is said to have existed in China many years before the birth of Christ, and has certainly been known and treated of under various names throughout the history of medicine.

Etiology.—Small-pox is one of the diseases whose contagion is as yet unknown. The disease is transmitted by direct contact and through the medium of infected articles, especially clothing and other woollen goods. Its area of contagion is greater than that of scarlet fever and measles, it being estimated by Thorne to cover about four thousand square feet. Susceptibility to the disease seems to be almost universal, but occasionally an individual is met

with who is immune. Since the introduction of vaccination it is not nearly so prevalent as in former centuries, and so large a proportion of cases are of the modified variety because of the practice of vaccination that it is not very often seen at the present time in its unmodified form. Notwithstanding the fact that the profession has not yet attributed it to a specific micro-organism it is quite well understood that it occurs only by contagion and is not forever developing *de novo*. As a rule one well developed attack renders the subject immune from subsequent attacks, but this rule is not absolute. In a lecture delivered at St. Bartholomew's Hospital, London, in 1889, the author heard Thorne, the highest authority in England on public health, recite several instances in which the disease had been known to occur several times, one case being cited in which it had occurred seven times, each succeeding time, however, in more modified form.

The contagious principle exists in the emanations from the skin. The disease is more infectious during pustulation than at any other time, though probably contagious from the moment fever sets in. There is very great danger of infection during the exfoliation of the epidermis in the form of dried scales, which, becoming powdered, are apt to be carried in the air or on the person or clothing of attendants. It seems to be largely a disease of the colder seasons. Various explanations are given for this, the most reasonable being that people are more crowded together in cold weather, houses are kept more closed, ventilation is not likely to be so perfect, and that bathing and other habits of cleanliness are not so apt to be practiced, especially among the lower classes of people, among whom it prevails most extensively. It is pre-eminently a disease of filth; its severest manifestations are always amongst people whose quarters are foul and whose personal habits are filthy. It frequently attacks camps, tenement houses, and the dirty quarters of the lower classes of foreign citizens, especially dark-skinned races, as Italians, Mexicans and half-breeds.

The infectious principle possesses wonderful vitality. If confined in clothing, carpets, curtains, and the like, in darkness and warmth, it may remain active for many months, and even years. It has been carried thousands of miles by letters and newspapers sent from the sick room and by convalescing patients. Hence the necessity for the exhibition of the greatest possible caution in the hygiene and sanitation of the small-pox room and patient.

Returning to its consideration in connection with children, it has been known to occur in the fetus in utero. Children have been born with small-pox. Others have been born pitted. Of course in these cases the mother has had small-pox during the intra-uterine life of the child. Nursing children seem to enjoy immunity, though occasionally sucklings have the disease. In

unvaccinated children of from one to ten years of age it is very prevalent during epidemics, and in Mexico among the ignorant classes it is quite the rule to encourage its contraction during child-life, even though the mortality during the first half decade is very great. Osler recites that during severe epidemics in Montreal, in 1885, eighty-six per cent of the deaths occurred in children not ten years of age. My experience in Southwest Texas, that has a large Mexican population, among whom it occurs almost every winter, leads me to believe that Osler's experience is unusual; for while the mortality among Mexican children is large it is not usually greater than among adults. It is the belief of that race that it is more fatal in adult-life, hence the practice of encouraging its presence during child-life. The Mexicans seem to accept it as one of the unavoidable dispensations of Providence, and therefore encourage it during the early years.

Symptoms and Course.—Small-pox presents a period of incubation varying from ten to fourteen days, during which time there are not apt to be evidences of oncoming disease. Its clinical course may be divided into four distinct stages, as invasion, eruption, suppuration and desiccation. The invasion stage is ushered in by a chill. This occurs usually without preliminary warning, and is so positive as to leave no doubt about its being a distinct ague. The chill amounts to more than a simple fever chill, as a rule; it is sufficiently pronounced to be almost deserving of the term congestive. With the chill and the fever which follows immediately, the temperature bounding at once to from 103° to 104° , there will be excruciating pains in the loins and limbs,

FIG. 30. Temperature chart in Typhoid.



FIG. 32.

and headache, usually occipital, although it may be also present as frontal headache of a bursting, throbbing, heating character. The pains in the back and head, evidently meningeal, are so intense as to cause severe prostration. In young children they even excite vomiting, nervous twitchings and spasms. In other instances the patient will be stupid, or delirious during the height of the fever. The skin is very hot and dry, or there is sweat with the heat. The fever of the invasion stage is continuous, lasting from twenty-four to forty-eight hours at a maximum height, with very slight if any remission. The average duration of this stage is about three days from the initial chill. A longer invasion stage is rather more favorable than a shorter, the latter being more apt to be attended by severe

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eruptive stage. Occasionally during the height of the fever there may be presented erythematous rashes, due to the fever; these may somewhat confuse the diagnosis, but they are not apt to last long, and when the distinctive eruption of small-pox occurs it is not likely to be mistaken for anything else.

ERUPTIVE STAGE.—The eruption of small pox presents in two forms, the discrete and the confluent. The latter is much more severe, and a far greater degree of disfiguration occurs from

it than from the first named type. In the discrete variety small red spots are first seen in the roots of the hair, on the forehead and, co-incidentally, on the wrists. The first manifestation of the eruption will usually present after three or four days of fever. If the physician is suspicious of the case, especially in children, he will be able to feel the shotty nodules under the skin before any manifestations of the eruption are discernible to the eye. From the forehead it quickly spreads over the face and neck and up into the scalp, over the wrists, over the palmar and plantar surfaces of the hands and arms, and from the head and hands on over the trunk until the entire body is more or less covered with it. This is the usual course of its spread, but in rare



FIG. 33.
SMALL-POX.—SIXTH DAY.

cases it may appear upon the abdomen and inner surfaces of the thighs prior to or co-incidental with its presence on the face and wrists.

The eruption shows first as small reddish spots or macules. As they come out the temperature falls, and the patient is greatly relieved of his aches and pains. Within twenty-four hours from the first appearance of the rash it is quite well developed, and within a few hours of the appearance of the macules they become sharply conical, from the size of a pin head up to that of a good-sized bird shot, or larger. The macular stage lasts but a few hours,

when the eruption increases in size and becomes papular. At about the end of the third day the apices of the papules begin to show vesicle-formation, and by another day the tip of each one of these little cones will umbilicate and the contents of the vesicle will become opaque or cloudy. By the seventh or eighth day the vesicles change into pustules and the umbilication will disappear, the conical tip of each pustule assuming more of the globular form, and showing to be filled with a grayish-yellow pus. At this time it will be noticed that there is an areola of injection about the pustules, and at this point the skin will be swollen and tense. Pustulation and maturation now occur, and each pustule is transformed into a small abscess surrounded by a halo or inflammatory circle. Maturation occurs in ratio to the development of the rash, appearing first where the rash first appeared, the first pocks presenting being the first to ripen. As this stage occurs there will be a secondary fever peculiar to this disease, the temperature quickly climbing to a point corresponding to its greatest elevation during the infectious stage. This secondary fever does not last, as a rule, more than twenty-four hours, but is quite severe while on. Allowing for the various stages experienced up to this time, the decline in the ordinary run of small-pox begins on the tenth or eleventh day, and with its subsidence the pustules dry quickly and the stage of desiccation begins and is well marked by the



FIG. 34.

SMALL-POX.—SEVENTH DAY.

fourteenth day, when the scales will dry and fall, leaving pits in the skin in proportion to the size of the pocks and the degree of maturation.

The eruption not only presents upon the skin, but there is also inflammation of the mucous membrane of the mouth, pharynx, and sometimes of the eyes and nose. It is to be seen in the mouth,

and occasionally cases exhibiting ulceration of the soft tissues occur. Severe glossitis is met with in exceptional cases, although the tongue is rarely the seat of the eruption. When the ocular membrane is involved there will be intense photophobia, profuse lachrymation and ocular distortion. In special individual cases



FIG. 35.
SMALL-POX.—ELEVENTH
DAY.

blindness has followed extensive conjunctival and corneal ulceration. The discrete form of small-pox is rarely responsible for pitting, under proper treatment. It is the stage of maturation that does the damage to the skin, and this stage should not be allowed to be reached. In the discrete variety the papules present as distinct and separate points with an area of healthy tissue between them, limited in extent. As the term implies, in confluent small-pox the eruption runs together, coalesces and, consequently, is much more destructive to the skin. The initial symptoms are the same as in the discrete form, but characterized by far greater intensity. The earlier the eruption commences the more likely it is to become confluent, and it may be stated as almost axiomatic that cases presenting the eruption prior to the commencement of the fourth day of the disease will develop

into the confluent type. Instead of being separate and distinct the pustules occur so plentifully that the face especially is covered with one great mass of conglomerate pustules, the epidermis being raised and greatly swollen by the presence of a plentiful quantity of sero-lymph. The constitutional symptoms are correspondingly severe. There may be vomiting and diarrhea, excessive secretion of saliva, enormous swelling of the hands and feet, suppurating abscesses of the glands, excessive suppuration of the skin, and if the mouth is extensively involved its appearance is simply horrible. The eruption is rarely confluent on the body, but the hands and feet are apt to present as one great sore. In this variety the temperature will rise to 103° and even 106° , and the pulse will beat from 130 to 150 per minute. The general bodily symptoms do not subside as early and completely as in the discrete form, while the local symptoms are also much more intense. Mastication, deglutition and phonation are almost impossible. The nostrils will be enormously distended, the eyes completely closed, suppuration of the middle ear will occur and the picture will

be repulsive in the extreme. The odor that arises from confluent small pox is intolerable, and, all told, it is difficult to imagine a more loathsome disease.

The natural course of small pox in the confluent form is apt to be prolonged to three or four weeks, if the patient lives that long. The mortality in this variety is very great and in recoverable cases the disfiguration is extensive and pronounced. If the general constitutional health prior to the attack is good, a child may pass through the severest confluent type into a fairly rapid recovery; but if, on the other hand, he is of rachitic, tuberculous or syphilitic history, his recovery, if it occur at all, is apt to be slow and attended by the exhibition of numerous pyemic abscesses, blindness, deafness, and other sequelæ, as well as by great disfiguration.

STAGE OF DESICCATION.—As the stage of pustulation subsides desiccation or falling of the crusts occurs. This scaling process is limited to the site of the pustules. There is not a general desquamation as in scarlet fever, but dry crusts or scales form at the site of each pustule and fall off during the third week, sometimes earlier, often later. At this time there will be a great deal of itching of the skin, as much as at any time during the presence of the disease, except when vesication is occurring. This is sometimes a very annoying feature, great sores being made because of children's scratching themselves, and unless the face be protected further scarification probably occurring.

It is desirable to interfere as much as possible with this process of desiccation and measures to prevent it should be directed to treatment prior to and during the process of maturation. The snipping of the vesicles, as already described, will make it very much less, and the application of carbolic oil or neutral lard or other unction will allay the irritation in good part and modify the scaling. All scales and scurfs should be at once destroyed, and in order to prevent the contamination of the atmosphere from the scaling and scurfing of the body the patient should be kept well oiled and indulged in frequent warm baths in order that the skin may be kept clear and free from scurf. Individual pocks may require the application of calendula oil, carbonized vasoline, hamamelis, cerate, or other favorite local application.

Hemorrhagic Variety.—The hemorrhagic variety of variola is an exceedingly dangerous form of the disease. It presents in two especial forms, *variola purpura hemorrhagica*, or *purpura variolosa*, an exceedingly fatal form of the disease, death usually occurring within a week of its onset; and a second variety, *variola hemorrhagica pustulosa*, the latter deriving its name from the fact that blood is effused into the vesicles of patients who are careless in pushing to a too rapid convalescence, the hemorrhage being usually confined to the lower extremities and showing as simple

petechiæ, much like the common variety of purpura hemorrhagica. No especial significance attends this form of hemorrhagic small pox. The effusion of blood in no wise depends upon the disorganization of the blood; the trouble is purely local, the hemorrhage simply occurring because the blood vessels of the integument have temporarily lost their tone and vigor.

The first named variety, however, is among the most malignant forms of small pox, and occurs more frequently in adults than in children. It ushers in about as does the confluent type of the disease, but by the end of the second or third day there presents a diffuse hyperemic rash, especially in the groins, from which occur simple punctiform hemorrhages. As the rash extends the hemorrhages increase and the spots become larger. Hemorrhages from the mucous membrane occur, as from the nose, mouth and eyes, ears and bowel. Hemorrhage from the kidney is also frequent. If the hemorrhages are profuse the rash may not appear at all. In other instances it may be as general as in ordinary forms of the disease, and because of the hemorrhagic exudation an appearance of general ecchymosis will be given to the case which is known among the laity as black small pox. I have seen but two cases of this variety, both in adults, one a negro and one a Mexican, and they were truly terrible to behold. In Caucasians the skin may assume almost a plum color and the body be swollen and bloated, with blood serum oozing from every pore. The constitutional symptoms are correspondingly severe, because of the altered state of the blood that admits of the hemorrhagic form of the disease, resulting often in convulsions and the early appearance of coma. The hemorrhages are usually not sufficiently severe to cause death from exhaustion, but death usually occurs so early that hemorrhage is not apt to play an important part in bringing about the fatal issue. This form of small pox corresponds to the hemorrhagic form of yellow fever. It occurs most often, as does that disease, among hard drinkers, but belongs also to the lying-in woman and, occasionally, to child-life.

Varioloid.—Modified small pox, or the disease as it manifests itself in persons who have been successfully vaccinated, is not likely to be seen in children, because if vaccination has been practiced upon them with success they are thereby rendered immune; and since successful vaccination affords immunity for a number of years very young children are not apt to be subjected to this form of the disease. It may occur, however, in the later years of child-life. It differs from the discrete form only in the fact that it is very much milder, often not necessitating the confinement of the patient to his bed. If, however, a number of years have elapsed from the time of vaccination until its appearance, it may run a very positive course and not differ materially from pronounced small pox. It starts in about as small pox does, very ab-

ruptly and with a chill; followed by fever, the temperature sometimes quickly climbing to 102.5° or 103.5° . The bodily suffering may be almost as severe as with the discrete variety of small pox, but the fever will not be so severe nor so prolonged. The eruption is very much milder and the stage of pustulation and pitting is practically absent. Maturation, when it occurs, takes place rapidly and is soon over with, but little suffering attending upon desiccation.

Complications and Sequelæ.—Taking into consideration the severity of small pox in children and its large mortality, its complications are really quite insignificant. They consist chiefly of superficial abscesses and glandular suppuration, with occasional phlegmonous inflammation of the cellular tissue. If the mucous tract is very much involved in the process broncho-pneumonia may present as one of the most common complications. The larynx may suffer from inflammation and ulceration of its cartilages or cords with more or less impairment of speech. Destruction of the globe of the eye, total blindness and ugly disfiguration may occur in malignant cases in which the ocular tissues are the seat of pustules. Considering the close relationship that exists between the kidneys and skin in the performance of their functions it is rather surprising that there are no serious kidney complications. Albuminuria is usually present during the height of the disease, but casts and epithelial debris will not often be found in the urine. Orchitis may occur when the parotid gland is involved, and in very delicate children gastro-intestinal complications are occasionally seen.

Diagnosis.—Small pox is so unlike any other disease it would seem there ought not to be confusion in making a diagnosis. But as a matter of fact it is not often, excepting when an epidemic is prevailing, that it is quickly recognized. There are few diseases that have such abrupt oncoming and such violent bodily suffering, especially such severe pain in the head and small of the back. Before the eruption is well developed there may be some excuse for confounding it with measles, lichen, and perhaps with chicken pox, but neither of these diseases presents the distinct initial symptoms of small pox. Greater confusion arises in differentially diagnosing it from measles than from any other disease, but the latter is very lacking in the severe lumbar pain of small pox, and small pox in turn, is wholly lacking in catarrhal symptoms belonging to measles. The measles rash is rough to the touch even before its presence upon the skin, but it lacks the positive shotty hardness of variola, and occurs first upon the face and neck rather than upon the forehead and wrists. Furthermore, measles occurs in crescentic blotches on the cheeks, whereas small pox, except in the confluent variety, presents a discrete eruption, each macule standing upon its own base. The hemorrhagic

type may be confounded with spotted fever, or the purpuric form of cerebro-spinal meningitis. The latter is especially a child's disease, whereas the hemorrhagic form of variola belongs almost exclusively to adults. Should death take place in the hemorrhagic form of small pox prior to the development of the rash, confusion is more likely to occur, but very careful examination of the skin will generally reveal the nature of the disease.

It is not thought necessary to discuss the differential diagnosis between small pox and the various skin eruptions sometimes treated of in this connection, it not being clear to my mind how it is possible for one acquainted by observation or careful study with variola to confound the disease with ailments having absolutely no constitutional symptoms or but mild manifestations at best.

Prognosis.—Typical small pox when occurring in young children is very fatal. The younger the child the more fatal the disease, and in severe epidemics in large communities at least one-half of the deaths are in children not five years of age. The next greatest mortality is between the fifth and tenth year. With its mortality among adults we have nothing to do in this volume.

The more pronounced the eruption, the earlier its presence, and the greater its confluence, the more fatal the disease. Cases characterized by initial symptoms of mild intensity, with moderate fever, rather slow development of the eruption, and reasonably brief and moderate stage of suppuration, are not apt to be attended by large fatality. On the other hand, if the onset is sudden and violent, the eruption severe and quickly developed, and the pustulation extensive, the death rate is large. Naturally the disease is more destructive in ill-nourished children and in those living in unsanitary quarters. It is also greater in children of dark-skinned people, especially in the offspring of different races. It is more fatal in winter and more fatal in some epidemics than in others. Cases characterized by pronounced blood disorganization are nearly always fatal and patients who suffer from meningeal complications, violent delirium, and convulsions are apt to die.

Prophylaxis.—The commonly accepted prophylaxis of small pox is vaccination. Coming at once to the use of remedies in this connection it is the practice of a number of physicians of the homeopathic school, especially those repudiating vaccination, to prescribe internal medication during the prevalence of small pox with the thought of protecting the system against its invasion. It is not known that it is held that any line of internal treatment can render people immune. The author confesses to incredulity as to the value of internal medication to that degree that he has not yet attempted its practice. Potentized vaccine and the potentized small pox crust have been especially recognized in this connection. *Medorrhinum* has also been given as a possible prophylactic, and a small but respectable number of homeopathic physi-

cians have attempted to substitute vaccination by the potentized remedy for vaccination with bovine virus. I must confess that I look upon these measures with grave doubts and from the best information obtainable am inclined to credit them as not being worthy of serious consideration at the hands of the profession.

Vaccination has been sufficiently considered in connection with the chapter on vaccinia. Immediately that small pox presents in a household or school every member of the family and every child who has been exposed, in school or otherwise, and has not been successfully vaccinated within a few years should be immediately vaccinated; if performed within three or four days of exposure it generally materially modifies, if it does not altogether prevent, the disease. If the initial symptoms are on, however, as headache, backache, and general malaise, it is too late, and vaccination will only aggravate the condition. It is held by some authors that vaccination after exposure is never justifiable for this reason, but this is believed to be a mistake, and if it can be practiced prior to invasion it should be done.

CARE OF THE PATIENT.—The small pox patient should be given a warm bath immediately upon the first manifestation of suspicious symptoms. A very hot bath will greatly relieve the cerebral and spinal congestions and should be given to clear the skin of its dirt and oil; it also induces the earlier presence of the eruption and secures, perhaps, less destruction therefrom. The small pox room should be well aired but darkened. It is difficult to explain the modifying influence of subdued light upon this disease, but it is a clinical fact worthy of note that inflammation of the skin and consequent pustulation are less severe when light is admitted to the room through dark red glass, or is excluded altogether during the eruptive stage. The room should be comfortably cool and at the same time comfortably warm, and by all means plenty of fresh air should be freely admitted. The diet of the small pox patient should be cooling and nourishing. Milk, buttermilk, gruels, beef and mutton broths, juicy fruits, and the soft foods generally are permissible. All clothing and upholstered furniture that can possibly be spared from the room should be removed and after the recovery or death of the patient it is better to completely destroy all bedding and clothing that have been used during his illness.

PITTING.—The prevention of pitting is an important question. All sorts of measures have been tried with varying success until it is now generally agreed that the best plan is to snip off the apices of the vesicles as they mature before pustulation will have occurred, in order to allow their fluid contents to escape. If pustulation goes on to maturation and the pus is allowed to remain confined it can be readily understood how the deeper skin is likely to suffer. In the small pox hospitals in San Antonio,

where the disease occurs among the Mexicans and negroes very frequently, nurses are supplied with small curved scissors and no facial vesicle is permitted to ripen if it can be avoided.

The favorite local application is glycerine and carbolic acid which is painted over the vesicles with a camel hair brush or applied on lint. If the face is very much inflamed free applications of cool carbolized water are used and are grateful. The eyes will require a good deal of attention, and should be thoroughly cleansed three or four times a day of all pus secretions. Unless this is done keratitis is quite apt to follow, as the lids will be very much swollen and agglutination and retention of foul secretions are almost certain to take place. Naturally a good deal of attention will have to be given to the mucous membrane of the eyes, nose and mouth, for these tissues are involved in the variola process. It is sometimes desirable to soften the olfactory membrane by the application of glycerole or carbolic acid applied by a camel hair pencil.

Treatment.—The stage of invasion of small pox is attended by violent congestion of the cerebral and spinal membranes and will require the application of such remedies as *Aconite*, *Belladonna*, *Gelsemium*, *Eupatorium*, *Veratrum viride*, *Cimicifuga* and *Bryonia*.

Aconite will usually be called for if there is a positive chill followed by high fever, intense thirst, great restlessness, hot, dry skin, and difficulty in inducing the perspiration which gives relief usually. I must confess I have not found *Aconite* as helpful in the invasion stage as its symptoms would lead me to expect. It seems to better suit the sthenic and inflammatory types of fever than those attended by profound blood changes and meningeal congestions.

Gelsemium is better adapted to the initial febrile stage than *Aconite*. Its action on the medulla and cord is well known. Severe pain in the back of the head and in the small of the back is quite characteristic of *Gelsemium*, and it has the full, bounding pulse, distended carotids, and the tight-band headache of variola. It also has intense aching of the limbs, and should dullness or apathy characterize the oncoming of the disease it is more than ever the remedy.

Belladonna suits the congestive type of case in young children with unusually purplish face, injected eyes, dry throat, full, bounding pulse and throbbing, beating headache, showing early in the disease. *Belladonna's* headache is splitting, throbbing, bursting in character. The child will beg that its head be held, the temples compressed, or that a cloth be tied very tightly around the head, so severe is the pain.

Bryonia has rendered most excellent service in the first stage of small pox, especially in negroes, though in whites as well.

where the meningeal symptoms have been unusually severe and the eruption slow in developing. This affinity for the meninges is undoubted, and I have never seen a case of small pox that did not have intense aggravation of all the symptoms belonging to the brain and spinal cord from motion. As in all eruptive fevers I account *Hyoscin* a prize in cases in which the eruption is slow in coming to the surface.

Tarlar sweeten has been pronounced nearer to a similitum of small pox than any single remedy in the materia medica. It applies especially to cases in which vesication and pustulation are very marked. I think it is Hughes who prefers it to any other remedy, and recognizes it as almost a routine agent. It is probably applicable when the mucous membranes are involved, and especially when bronchitis or broncho-pneumonia presents as a complication with accumulation of mucus in the bronchial tubes, the patient coughing as though his throat were full of mucus. The face is purplish and blue, and breathing is very difficult. It is also an excellent remedy in cases characterized by considerable gastric irritation.

Veratrum viride applies to the congestive stage of the disease when the head is hot and the extremities cool and cyanotic. The pulse is full and rapid, headache is marked, but not so marked as with the *Belladonna* case, and worse in the back of the head, with pain in the small of the back. It is especially to be thought of if with the fever there is perspiration.

Cimicifuga.—No remedy has served me better in the intense backache and rheumatoid pains of variola than the coltsfoot. The brain aches as though it would burst, and the backache is agonizing. The whole body feels sore, the muscles feel as though they had been pounded and beaten, and the bed seems so hard that a bed of bricks or stone is preferred. The brain feels contracted, and the spinal cord aches so badly that the patient desires to be held firmly against something very hard. While not possessed of specific action upon the skin, yet I have confirmed the thought that the continued use of *Cimicifuga* throughout the invasion stage modifies the degree and severity of the eruption.

Rhus tox. is a close analogue to *Cimicifuga* for the severe rheumatoid pains of the muscular system. These pains are all aggravated at night in the *Rhus* case. The bed is too hard; the patient is restless and tossing; the tongue is dry and pointed, and the headache is more general all over the head, the soreness of the scalp being greater than when the membranes are involved. The *Rhus* skin is mottled and swollen, and this remedy will also be indicated very often when vesication commences if the vesicles are small and plentiful.

Thuja has been highly lauded in small pox, and is undoubtedly useful, especially in the eruptive stage. The pustules are

milky and flat and painful to the touch, and the inflamed area around them is darker than it ought to be. When maturation occurs it is exceedingly offensive. *Thaps* is especially applicable to repulsive cases occurring in children of strumous or sycoitic history.

Lachesis, *Arsenicum*, *Crotalus* and *Baptisia* are applicable to blood poisoning conditions as in typhoid and typhus fevers, diphtheria and like diseases. *Cantharis* is sometimes useful in the vesicular stage when there is intense itching and burning of the skin, with vesicle symptoms occurring reflexly. The local application of *Cantharis* in very weak dilution, or diluted attenuation of the remedy, relieves the severe burning of the skin prior to the development of the vesicles.

Mercurius, *Hepar*, *Sulphur*, *Thaps*, *Kali sulphuricum* and *Graphites* are called for in the suppurative stage.

Mercurius administered at the time pus is forming in the pustules promotes maturation, and will very often serve to modify or prevent pitting. *Hepar* is to be given where suppuration is continued. The pus is offensive, thin and flaky.

Sulphur belongs not only to the stage of suppuration with glandular involvement, but it meets metastatic brain symptoms with non-development of the eruption. It is often found exceedingly useful in suppurations of the skin the suppuration of small pox being no exception.

Kali sulphuricum has a nasty, sticky pus. The disease is of the confluent variety, and a sticky crust forms over considerable area. It has inflammation of the skin, and the crusts mature and fall off more quickly in this disease.

Kali phosphoricum is suited to low typhoid states with intense putridity of the pustules and sores in the mouth and nose. The stench is intolerable, the patient prostrated and in a low sunken state from which it is difficult to arouse him.

Graphites is adapted to cases characterized by gummy suppuration, plentiful secretion of thick, yellow matter, which agglutinates in great scaly crusts, the scalp especially and the back of the neck being involved and the cervical glands enlarged and suppurative, exuding thick, gummy, yellow matter. The hands are covered with yellow crusts, and between the fingers and toes there is an exudation of yellow mucilaginous discharge. Strumous children will often need *Graphites* to clear up the conjunctivitis and inflammation of the lids which follow upon small-pox.

The hemorrhagic variety will call for *Nitric acid*, *Scilla*, *Phosphorus*, *Muriatic acid*, *Crotalus*, and *Lachesis*.

Phosphorus is adapted to cases presenting as a pneumonic complication, or with the hemorrhagic feature marked, or the two conditions combined. It is especially suited in the bright hemorrhage from the lungs which is so severe as to induce fainting and ex-

hæmation. Hemorrhage from the pustules, with continual oozing of blood from small points or individual pocks; the patient is thin and scrawny, and in case he survives the hemorrhage is apt to sink into a low typhoid state.

Hæmofelis is adapted to the hemorrhagic variety of small-pox, with dark oozing, bleeding from the gums, epistaxis, bloody stools, hemorrhage from the genital organs and general purpura.

Nitric acid is especially adapted to hemorrhage from the bowels, and will sometimes be called for in violent epistaxis. The blood is bright and hot, the patient excessively weak and debilitated.

Muriatic acid is applicable to the lowest stages of the disease, where the perspiration is excessive and the patient is in a sunken, exhausted, collapsed condition. Disorganization of the blood occurs and the patient loses control of his functions.

Sulphur is useful in sunken states, profound putridity, blood disorganization, hemorrhage occurring from every pustule and from the genitalia. Active hemorrhage from the nose and lower orifices.

Lupulus and *Crotalus* are best suited to putrid types of the disease with general exhaustion, stupor and blood disorganization, and both mental and physical hebetude.

Hydrocyanic acid has been highly recommended in malignant cases of small-pox, with profound nervous debility. The dilute acid is a domestic remedy of great favor. It has been used externally in weak dilution and also internally, and is undoubtedly possessed of some merit.

CHAPTER XXVI.

TYPHOID FEVER.

General Considerations—The Typhoid State—Etiology—Symptoms and Course—Invasion—Petechiæ—Tongue—Cerebral Symptoms—Diarrhea—Temperature—Glandular System—Elevation and Hemorrhage—Diagnosis—Appendicitis—Acute Miliary Tuberculosis—Prognosis—Nervous Type—Pulmonic Type—Gastro-intestinal Type—Febile Type—Ambulatory Type—Abortive Type—Complications.

General Considerations.—By no means is typhoid fever a disease of childhood. In this country it is rather a disease of youth and early manhood; and yet in a given number of cases occurring without special epidemic cause full fifty per cent. will be found in children between five and ten years of age. Hemoeb's observations give one hundred and fifty-four cases out of two hundred and sixty observed as occurring during child-life between

the ages of five and ten years; and Vogel records four hundred and twelve out of ten hundred and seventeen as occurring in the same five years of child-life. Earle records observations, which are, however, limited, showing about the same proportion. The years from ten to fifteen show the next largest number of cases. So that, while a disease which occurs at nearly all ages, it is common to children, hence deserves consideration in this volume.

Typhoid fever is an acute infectious disease, having its anatomical seat in the small intestines. It is a common ailment and its history extends over past ages. Not, however, until the early part of the present century was it differentiated from typhus, or ship fever, and its etiology and careful classification are of really recent date. The chief features of the disease are the fever, rash and long continuance of the ailment, together with general involvement of the large and small abdominal glands. It is one of the most tedious of the acute diseases, and one of the most fatal.

The Typhoid-State.—The typhoid-state is characteristic. When present, no matter what stage the fever may assume, there is a peculiar, prostrated, apathetic, sunken condition of the system that is very characteristic, and unlike states peculiar to other fevers. Wherever this picture is seen, whether in association with the acute eruptive features, puerperal fever or surgical diseases, the term is used adjectively. Except in states of excitement when the patient's conduct is maniacal, he is sunken in torpor, settles down in bed in the dorsal decubitus, and is indifferent to what is going on about him. His features are relaxed and expressionless and his eyes sunken, with dark circles beneath them; his mouth and tongue are dry and parched, with sores on the lips and teeth. He is more or less indifferent to his physical functions, paying no attention to involuntary actions from the bladder and bowels, or not complaining of his constipation, which is pronounced if present, nor of retention of urine. If roused to take medicine or nourishment he immediately falls off again into stupor. His delirium may be mild and muttering, or it may be wild and excited. In the latter case the picture would hardly be spoken of as "the typhoid state." It is the prostration and indifference, the simple hanging on to life by animal strength, that specializes this. Children will pay no attention to anything that is going on about them for days at a time, even if awake and conscious; they have few complaints to make, responding mechanically to demands upon them.

Physically weak and debilitated, they show trembling of the muscular system as they make effort at stool, or try to help themselves in eating or drinking. In the febrile type the cheeks are mottled and the features are drawn tightly about the facial bones over the lower part of the face. The forehead is glistening and hot, the patient is dull and tired, and the dryness of the nasal

membrane causes the child to pick at its nose almost constantly, making it bleed, the alle and fingers being covered with bloody crusts. Children also pick at imaginary objects.

The reverse of the typhoid stupor occasionally occurs, and instead of the low and stupid state there will be muttering delirium, with constant talking and inability to go to sleep. The patient makes no effort and complains of nothing, but is in a wakeful state, the coma vigil of typhoid fever. If asked to protrude his tongue he pays no attention to the request, but keeps on talking and it is only by special effort that the physician or nurse can attract his attention and secure responses from him.

Etiology.—It has been ascertained beyond reasonable doubt that typhoid fever is due to a specific micro-organism, the bacillus of *Eberth*. The commonest cause of the disease is polluted drinking water, some authors going so far as to say that it occurs invariably from this cause. The bacillus that is presumed to be its etiological factor is found in impure water, water contaminated by seepage of animal matter, sewage,



FIG. 36.

TYPHOID BACILLI IN THE WALL OF THE INTESTINE.

etc., and in milk from cows who have drunk impure water. In a recent epidemic in Washington, D. C., it was held by the profession that the disease was directly traced to befouled wells from which drinking water was used, much the larger number of cases occurring in portions of the city using well water. St. Louis suffered a violent epidemic a few years ago traceable to contamination of the water supply. Boston was puzzled over a severe visitation of this disease fifteen years ago,

until it was found that the water-shed from which the water supply was taken was contaminated from farms and the sewage of small towns. Chicago suffered severely in 1891-92 from contamination of her water supply, and with the introduction of better drinking water from her four-mile crib the disease disappeared in epidemic form. Individual cases may be traced in nearly every instance to the use of contaminated water, unless due to milk contaminated from the same cause. The discovery of this fact and its certainty has enabled sanitary officers to materially decrease the prevalence of typhoid fever in large cities by bringing about needed improvements in the direction of better drinking water. No disease is so preventable under ordinary circumstances, and

the existence of typhoid fever in a family or community should always prompt intelligent efforts at ascertaining the cause, that it may be removed and other cases prevented.

The specific germ to which the disease is charged is a short, thick, mobile bacillus, having rounded or dumb-bell ends. (See colored plate.) It is rendered



FIG. 37
TYPHOID BACILLI FROM SECTION
OF SPLEEN (PLAQUE).

easily discernible by staining with methylene blue, and in well marked cases of the disease is to be found in large numbers in the intestinal walls and follicles, Fig. 36, the liver, spleen, Fig. 37, and mesenteric glands. It has also been found in the blood, brain, kidneys and lungs of typhoid fever patients. It is cultivatable upon various culture soils, and resists the presence of strong acids, Fig. 38. It is short lived in drinking water, living from but ten to fourteen

days, and the continued prevalence of the disease implies continued contamination of the water supply. Boiling completely destroys

it, and therefore in the presence of typhoid fever in a family, school, hospital, or community the precaution should be taken to drink only water that has been boiled and afterward cooled in closed vessels. This is the most certain safeguard against the disease. In this disease, as in others, it is not yet clearly settled whether the disease process be due to the bacillus, per se, or to the toxins developed by them. The typhoid bacillus develops a ptomaine called typhotoxin, and perhaps a toxalbumin, and to the poisonous influences of these chemicals may be due the initial manifestations peculiar to typhoid fever. The invariable association of the bacillus of Eberth with the typhoid process certainly leads to the conclusion that it is either directly causative or its poisonous off-put is the etiological factor. And,



FIG. 38.

Typhoid bacilli in mucous membrane of small intestine (colon). a, epithelial cells of crypts; b, small round cells like adenoid bodies; c, typhoid bacilli in colonies.

clinically, this has been too clearly settled to admit of doubt, even though the *modus* is not altogether understood, as yet.

Not only is typhoid fever produced from impure drinking water and contaminated milk but the use of natural ice is one of its common causes. Pond ice and river ice frequently set up the disease, the bacillus resisting the influence of cold and retaining its vitality in ice as in water. Boiling alone destroys it. It is also well understood that typhoid may be conveyed by direct infection; and while not intensely contagious yet nurses and attendants in close relation with typhoid fever patients for a length of time often come down with it. It is transmissible by the breath, but more so by excrementitious matters. Hence every particle of excrement and all excretions of typhoid patients should be at once destroyed by burning or by burying in quick lime. Never should they be emptied into sewers or buried in soil, especially near wells from which drinking water is obtained. The deposit of human excrement from typhoid patients in grey vaults or on dung hills is next to criminal.

In rural districts it is common to see cases of typhoid fever scattered here and there throughout a community, it being difficult to trace the disease to direct infection. This happens most often in the spring, when the ground is being ploughed and the manure of the previous fall is being turned under the soil; or it occurs in the fall after the farms have been manured and while the manure is rotting. Especially does typhoid fever occur in the country in warm fall seasons and mild winters. And hereby the idea gains strength that the disease is caused by the introduction into the system of animal poison from manured fields or manure heaps. Foul barnyards, pig-styes, and large manure-heaps, if to the windward of the house, are exceedingly dangerous. When the disease occurs from this cause, as it certainly does, the poison is probably introduced by inhalation.

It occasionally happens that a village or small town or a number of farms will suffer from typhoid fever without the cause being easily traceable. I recall one instance in which a whole town suffered from the death of a wounded animal at the spring from which the water supply was secured, the spring being several miles away from the reservoir. And it often happens that one town or neighborhood will visit typhoid fever upon another by polluting the stream from which the water supply of the endangered town is taken.

Foul privies located to windward of the house, or perhaps the carcasses of a dead animal, some distance from the habitation, will cause typhoid fever among its inmates by inhalation of the germs carried upon the atmosphere, sometimes for considerable distances.

Symptoms and Course.—Typhoid fever presents a period of incubation covering from two to three weeks. During this time

the patient will be more or less languid, and will have headache and general physical and mental inertia. Constipation is often present, but in occasional cases diarrhea will occur as an initial symptom. Anorexia and nervous restlessness characterize the oncoming of the disease in special cases, and now and then headache will be the most prominent symptom, with occasional nose-bleedings. Aching of the back and limbs and flitting pains of a neuralgic character are experienced, a general feeling of unwellness attending the incubative period. Should the thermometer be called into requisition at this time there will be found sub-normal temperature in the morning and a rise of half a degree at night, before the invasion stage has become clearly defined.

INVASION.—Invasion is usually sudden and characterized by a positive chill, quickly followed by fever, the temperature immediately mounting to two or more degrees within a few hours. In many cases the chill will be followed by profound prostration, and the patient will show at once that he is very ill. With the first rise of fever, if not during the incubative stage, there will be felt soreness of the bowels, general sensitiveness over the abdomen, and some enlargement and tenderness of the liver and spleen will be revealed by palpation. Soon the tenderness becomes more noticeable and in the ilio-cæcal region especially will be pronounced, though this fact may be discovered only upon careful and deep pressure in this locality. If diarrhea attend from the start there will be soreness and tenderness with it. When the patient is constipated this symptom is not so apt to be present in the early or invasive period. Tympanites is an early symptom, and the degree of distention is frequently so great as to give considerable discomfort. With these symptoms there will also be headache, thirst, nervous restlessness, or dullness, dry lips and tongue, and considerable apprehension. In the more sluggish type dullness and indifference will predominate, but in children the nervous type has predominated in my experience. Occasionally bronchial cough will be an annoying symptom from the incipency, or it will set in in the early part of the disease, being due to dryness of the bronchial membrane and nervous irritation.

PETECIÆ.—Typhoid fever presents an eruption on the abdomen in about seventy-five per cent of cases, whether occurring in adult or child-life. In children these spots are rose-red, slightly elevated, appear singly, rarely in clusters, and disappear upon pressure. They are not often present before the end of the first week, and come in successive crops from week to week during the course of the fever. Sometimes there are but few of these spots, while in other cases they are as numerous scattered over the abdomen and lower part of the chest as varicella pocks are over the back, in a well marked varicellæ case. These petechiæ are not attendant upon remittent fever, and their presence in connection with continued

fever with characteristic temperature gradations makes the diagnosis of typhoid fever certain. They disappear with the subsidence of the fever and are not followed by desquamation. Coincident with aggravation in the diarrhea and other enteric symptoms there will be noted a recession or lessening of the rose spots, and when they are in full efflorescence the intestinal symptoms are generally milder.

TONGUE.—The tongue of typhoid fever is always very characteristic. During the first week it is simply coated, usually with a thick, white coating, and is clean on the edges and at the tip. Occasionally it will have a red and glazed strip down the centre, with coating on either side, the edges and tip red. But as the disease progresses the typhoid tongue shows up. It will present a bright red tip, with a triangular area of redness extending from the very point some distance backward, the tip being the base of the triangle. From this base there will extend backward a clean red strip in the centre of the organ; or this will become brown, dry and glazed. The tip shows the little papillae standing up and inflamed. These get very sore in some cases. Occasionally the tongue will remain moist throughout, but this is rare. In other cases it will be heavily coated with brownish fur, with papillae standing up here and there, red and inflamed. But the typical typhoid tongue has the red tip, with base forward, the inflamed papillae, the dry streak down the centre and the red edges.

The tongue and gums and even the buccal walls become covered with *sordes* in the progress of the case and sometimes the mouth and tongue get very sore. *Sordes* gather on the teeth, necessitating frequent cleansing. As the case improves the mouth becomes moist again, the coating on the tongue re-occurs, the *sordes* disappear, and the patient gradually regains control of his lingual organ. It is often so sore and stiff, the nervous manifestations are so marked, and the mental *hebetude* is so great that he will not have been able to articulate distinctly or to protrude his tongue properly for days or weeks. Returning moisture and control of the tongue are among the first satisfactory signs of improvement in typhoid fever.

When the tongue is sore, stiff and inflamed it will be grateful to the patient to have it moistened occasionally with gum arabic water, or with slippery-elm or flax-seed water. Calendulated flax-seed water is a healing liquid for these cases. Neglect of the tongue and mouth often gives great discomfort and thereby increases the fever.

CEREBRAL SYMPTOMS.—These manifest themselves in all types of typhoid fever, from simple headache and insomnia to the severest congestive headache and meningeal inflammation and convulsions. Headache is nearly always present, though cases

occur in which no complaint in this direction will be lodged. Usually the pain is in the forehead, and is of a "tight band" character; or it may be a throbbing, bursting, splitting headache. Occasionally there will be present a case in which there are neuralgic pains, genuine cephalalgia. Young children are not as liable to headache as adults, but youths may suffer more from it than from any single symptom. Besides headache there is nearly always delirium at some stage of the case, whereas in the nervous type delirium and other severer cerebral symptoms are characteristic. In types other than the *febris nervosa* the delirium will be milder and less constant. Muttering, starting, wild wandering and incoherent rambling, with perhaps an occasional outburst of severer manifestations, will be all that come up in most cases. The nervousness belonging to typhoid fever causes children to pick at their fingers, or nose, or bedclothes, or at imaginary objects, generally supposed to be a bad sign, but, as a clinical fact, possessing no special significance.

With the headache there will often be nose-bleed, sometimes so severe or so oft repeated as to occasion concern, but usually it affords relief from the congestive headache characterizing cases in which it occurs, and is not generally troublesome. Severe hemorrhages from the nose may require active measures, constitutional and local, the latter consisting of nasal douches of very hot water, with or without *Hamamelis*, and, perhaps, plugging of the nares. Applications of very cold clothes to the forehead or back of the neck will sometimes check persistent hemorrhages from the nasal organ.

DIARRHŒA.—Diarrhœa is one of the ugliest symptoms of typhoid fever and is dependent upon ulceration of the patches of Peyer and glands of Brunner. Occasionally it is an early symptom, but constipation is often present at first and diarrhœa comes on as the case progresses. It usually commences toward the end of the second week. The discharges are thin and offensive, yellowish green in color, the "pea-soup" diarrhœa of this fever, and quite frequently occur without ability on the part of the patient, whether adult or child, to control them. In fact, diarrhœa in typhoid almost always goes on involuntarily and unconsciously. It is, therefore, generally painless, though often excoriating, requiring care to prevent troublesome excoriation of the raphe and buttocks. Bed sores are frequently directly traceable to failure on the part of the nurse to promptly change the bedding or clothing and properly cleanse the patient after involuntary urination or defecation.

The discharges may be very frequent, occurring as often as every hour or two through the day and night, or be limited to three or four a day. They are horribly offensive as a rule, and if follicular ulceration is going on may contain speckings of blood

and small sloughs. In severe cases where the intestinal membrane is deeply infiltrated and extensively ulcerated considerable sized sloughs will be seen in the discharges, which are blackish-green and of gangrenous odor. Diarrhœa may continue for a number of days. It should never be checked suddenly; for its suppression results in an aggravation of all other symptoms, even to peritonitis and convulsions. Medication should be directed toward modifying the conditions causing it. If left unsuppressed it will grow less as the natural course of the disease is run, and the stools will gradually become consistent and normal in a week or two, sometimes earlier. In occasional severe cases it becomes chronic and intractable.

TEMPERATURE.—The fever is peculiar. It rises, as a rule, one degree a day for seven consecutive days, is a degree higher in the evening than in the morning of the same day, and is a degree higher at that hour than at the same hour the evening previous. This steplike regularity of ascent is very characteristic of typhoid, and the surer the temperature ascends by stair-step gradations the more certainly typhoid is the case in hand. There are deviations from this order; nor is it to be taken that this typical rise of temperature belongs especially to child-patients; variations from morning to evening are apt to be greater than a degree, sometimes as much as two or three degrees, while the case will yet remain one of pure typhoid fever. The height which the fever attains by the close of the first week is significant, in that it affords an index to the type of the case; for the higher the registration the first week the more violent the case is likely to be. This applies to other conditions of the patient, as well as to the temperature. By the end of the first week the fever will usually have attained its maximum, or nearly so, and will settle into a steady range, not varying greatly, though somewhat influenced by local surroundings in individual cases. Rather too much stress is laid upon the thermometric indications, and it is enough to say that for diagnostic determination there should be an approach to the stair-step climb. The first week is one of ascent; then come about two weeks of continuous elevation, followed by another week, or two or three, characterized by various remissions and exacerbations until the final subsidence. The course of the temperature range corresponds to the pathological lesions that are going on within the system, the first condition being the hyperemic state of the intestinal follicles and glands. Following this, tumefaction and infiltration occur covering the second week; during the third, and following upon this condition, sloughing, with or without hemorrhage, occurs; and by the end of the fourth week the cicatrizing process is well established in cases that recover, unless, perchance, it be one of unusual severity and slow progress.

Pronounced variations from the regular temperature range of typhoid fever occur when cerebral symptoms are present and are severe. It may climb in severest cases to 106° or 107° , or even higher. If sharp hemorrhage results upon intestinal ulceration there may be sudden sinking of the temperature at the time or following immediately upon its occurrence. If perforation of the intestine occurs the temperature may fall quickly to normal or sub-normal.

GLANDULAR SYSTEM.—The anatomical site of typhoid is in the intestinal follicles and Peyer's patches, and when these glands are involved the larger glands suffer, especially the liver and spleen. The spleen begins to swell almost with the initial symptoms of the disease, and remains swollen and tender throughout its entire course. In special cases it encroaches upon the abdomen, showing pronounced dullness over the region of the stomach. It is one of characteristic signs of typhoid fever in children, in whom these boundaries are more especially defined than in adults. Filatow looks upon splenic tumor as one of the essential symptoms of typhoid in children. He holds that it can be demonstrated about the fifth or sixth day in most cases, and that it is present in fifty ninety per cent. of typhoid fever occurring in child-life. Vogel is reported to have seen splenic tumors in six hundred and six out of six hundred and sixty-six cases. In association with malarial complications coming under the classification of typho-malarial the spleen is always tender to pressure and enlarged, sometimes pronouncedly so.

The liver is tender during the first week in more than half the cases of typhoid fever. It is, however, especially in typho-malarial conditions that this organ is hyperemic and sore.

The kidneys are apt to be pathologically disturbed, especially in children, and considering the fact that the quantity of urine is always greatly decreased and heavily charged with urea it is rather remarkable that these organs retain their patency. No especial value is considered to attach to Ehrlic's test in children, since the conditions described are witnessed also in acute tuberculosis and various other diseases of childhood.

ULCERATION AND HEMORRHAGE.—From the third week of typhoid fever the infiltrated tissues undergo sloughing or ulceration. The ulcers are revealed in the vicinity of the ilio-cæcal valve by percussion or palpation; but deep pressure of the fingers should never be practiced when the prognosis of typhoid is established. The less the ilio-cæcal region is manipulated the less the danger of injury therefrom. Where ulceration occurs the blood-vessels of the intestine are destroyed in the ulcerative process, and hemorrhage ensues. This may happen at any time during the third or fourth week of the disease, simply from erosion of the blood-vessels, or the breaking open of cicatrizing tissues at the

site of a healing ulcer. In some cases it is so slight as to amount to nothing, while in others the quantity of blood that is discharged, usually in clotted form, having been retained for some time in the colon or rectum, is considerable. If severe the patient sinks into a stage of collapse, the temperature suddenly falling five or six degrees, even to subnormal. If the hemorrhage is not fatal the system reacts within a few hours and the temperature again pursues its high course. Hemorrhage is much more rare in children than in adults, and is not so likely to be fatal; but if the ulceration be extensive such an amount of blood may be lost as to add to the gravity of the case, and there may be seepage to such degree that recovery is impossible. It occasionally happens that an artificial twig of sufficient size to admit of fatal bleeding will be destroyed and the patient will die from internal hemorrhage.

Especially is the prognosis grave when extensive sloughing or sharp hemorrhage occurs; but these conditions are not necessarily fatal, and are not often observed in typhoid fever in childhood.

Diagnosis.—The diagnosis of typhoid fever is not difficult; a typical case should never be mistaken. Error may arise from hasty conclusions reached in the earlier days of the fever when some especially local affection is presented, as bronchitis, diarrhea, or pneumonia. But the typical onset of typhoid, the degree of fever that is present, its regularity of climb during the first week, with its settling at a high grade in the second week, together with the tenderness in the right iliac fossa, the petechiæ, tenderness of the spleen, and the physical prostration make a picture that is not shown in any other disease. Typhoidal states belong to various diseases, as pneumonia, septicæmia, measles, dysentery, etc., but there are always distinguishing symptoms, and the careful diagnostician is not likely to confound real typhoid fever and any other pronounced ailment. Confusion arises in Southern sections of the country from the presence of an admixture of typhoid and remittent fever in childhood, these cases varying from genuine typhoid fever in that malarial periodicity is shown, with variation from the typical typhoid temperature-gradations, malarial cachexia, greater enlargement of the spleen and hepatic derangement, without the special manifestations of pure typhoid, a pure case of malarial fever rarely taking on typhoidal character. Nor, on the other hand, does a case of genuine typhoid fever take on malarial periodicity; but the two types of fever may show in the same subject so pronouncedly in malarious districts that the differential diagnosis is sometimes difficult, and if too great dependence is placed upon the thermometer the physician will be deceived. The rose-rash, bronchial cough, ilio-cecal tenderness, gurgling diarrhea and greater prostration will serve to clear the diagnosis, even though typhoid be complicated with malarial manifestations, as is not infrequently the case. It is rare in the South and South-

west to see a case of typhoid fever pursuing its regular course as witnessed in the Northern states and in Europe; but in the fall season in malarious districts of country a great many cases of continued fever presenting both typhoidal and malarial symptoms occur annually.

APPENDICITIS may be mistaken for typhoid fever, but this state is more acute, and the symptoms, especially pain, are more pronounced. In place of the gurgling in the ilio-cecal region, with tympanites, there is an increased resistance and a relatively duller percussion. Enlargement of the spleen and bronchitis are not present in appendicitis, and the patient draws up his leg in the latter-disease to secure relaxation, while in typhoid he is apt to assume the dorsal decubitus and retain it.

ACUTE MILIARY TUBERCULOSIS may be mistaken for typhoid. Its onset is gradual; there is local prostration, coughing and fever, and the bronchial symptoms are more pronounced than the intestinal; whereas in typhoid the reverse is true. Tubercular fever is more likely to have recurring chills and sweats, and the temperature has an irregularity of grade that does not go with typhoid. Furthermore, the emaciation is much more rapid, and instead of the ilio-cecal crepitus, with diarrhea following upon previous constipation, tubercular fever manifests the latter only. I have met with but one case in which there was confusing association.

The objective symptoms in typhoid fever are helpful in making the diagnosis. The face is pale rather than flushed, as in the hectic type of tubercular fever. The patient has a dull, listless, apathetic expression. The tongue is heavily coated white, and is at first flabby, but soon becomes yellow, and as the fever is fairly established gets red at the tip and brown in the centre, the papillæ standing out prominently and appearing very red on the tip. The headache is almost constant, giving the eyes an unusually dull and heavy expression, and the patient's languor is so pronounced as to be pathognomonic.

Nervous Type.—Typhoid presents in so many different types that it is not easy to give a description that will cover all cases. It has been aptly termed "nervous fever" by many authors, and a fair share of cases will permit of such an exalted state of the nervous system that all the symptoms will point in that direction. Nervous irritability, peevishness, crying, fretting and vehemence characterize the disease from its onset; delirium sets in early; the patient tries to get out of bed and away; he fights, frets, scolds and wears out himself and attendants because of his wildness and delirium. These cases will have severe headache, nervous twitchings and convulsion after convulsion. Mania manifests occasionally and wild hysteria is likely to occur, in nervous females especially. As the disease progresses this type of case quiets down to exhaustion; but the muttering delirium, headache and

other nervous manifestations continue in proportion to the physical strength. Even when so weak as not to be able to rise from bed the patient will try to get up, only to fall back exhausted and worn out.

Pulmonic Type.—This is characterized by severe and constant cough. The throat and bronchial membranes are dry and a tickling, titillating cough is invariably with the patient, annoying him, preventing sleep, and keeping up a more or less constant effort of the muscular system either by the cough or the effort to resist it. Labor pneumonia occurs, and there will be rusty-colored sputum, pains in the chest, and pleuritic stitches, impeded respiration, dyspnea, and in consequence of imperfect oxygenation dullness and cyanosis will be present. Percussion reveals dullness and immobility over the upper border of the lungs; crepitant or sibilant rales, and decreased vesicular murmur are also discoverable.

Gastro-Intestinal Type.—This type will be characterized by unusual constipation at first, followed by diarrhea; or diarrhea may show from the start. The tongue will be dry and red at the tip and edges, and anorexia, nausea, even vomiting, and general soreness of the abdomen, with distension and borborygmus, are almost invariably present. Vomiting is not as constant an attendant of this type as diarrhea. This is of the "pea-soup" character, the discharges being thin, watery and flaky, yellowish-green or greenish-yellow. They are small, frequent, acrid as a rule, and attended by straining and an unsatisfied feeling.

Febrile Type.—The febrile type is characterized by very high temperature, full bounding pulse, intense headache, nose-bleed, violent delirium, or profound coma, and great thirst, unless the patient is so stupor as not to be concerned about anything. This type is the most common. The thermometric range is peculiar, and when present in its typical gradations is considered certainly diagnostic of the disease. For the first five or seven days there will be a steady climb of the mercury, with the evening range a degree or a degree and a half higher than the morning temperature; this in turn, until its maximum has been attained, is a degree and a half higher each morning than the temperature of the morning previous. Thus: If the morning temperature of one day is 99° the evening temperature of that day will be 101°; the next morning the temperature will be 100° and the evening temperature 102°. And so on until its height has been reached, the climb being by stair-step gradation. The more marked the regularity of the morning and evening temperature-climb the more characteristic the disease. In individual cases the jump from morning to evening may compass three or four degrees, but as a rule the climb will be by easy but successive stages. Usually the decline is as gradual as the ascent; though in really typical cases it may occur by crises instead of by lysis, and the fall may cover

four or even six degrees in a few hours, the patient collapsing into death or sinking into prostration from which there will be very gradual convalescence. In intestinal cases terminating by perforation and hemorrhage the decline may be sudden and severe, covering a range of seven, eight or nine degrees, falling from the highest range of the case to subnormal in an hour or two. (See "Temperature.")

Ambulatory Type.—It is not uncommon to meet with cases of well marked typhoid fever the subjects of which do not go to bed at all, or but for a day or two at most. Especially are these cases met with in children. The patient will have all the symptoms of mild typhoid fever, headache, lassitude, aching of the muscles and tendons, especially of the back of the neck and hamstrings, with diarrhea and petechia present as in severer types. The temperature will show the same gradations, the tongue will present the symptoms peculiar to mild types of the fever, and the nervousness and irritability of the patient will be right along the line of typhoid fever. This ambulatory type is typhoid fever, and presents all the lesions of the lighter manifestations of the disease. It ends in recovery, and is of shorter duration than cases demanding retirement to bed. And yet ambulatory cases have resulted fatally. So much depends upon the tenacity and determination of the patient that it is not always easy to say that because the child has gone through a course of fever without giving up it has not been as ill as some other member of the family who has had to go to bed for three or four weeks. Children who persist in keeping about, and who will not go to bed and remain there without too severe struggle, should be watched as closely and treated as faithfully as bed-ridden subjects. Their very persistence may result disastrously to them if their cases are neglected.

Abortive Type.—An abortive type of typhoid fever is in occasional evidence. It commences violently and shows all the initial signs of typhoid fever, but instead of pursuing the regular course of the disease terminates at the end of the second week. These cases are seen very frequently, and especially present irrelevantly to epidemic or endemic manifestations of typhoid fever. Confusion arises just here in making the diagnosis and in heralding the action of individual remedies. This abortive type recovers independently of treatment, but if it is treated there is no reason why the cutting-short process may not be advantageously associated with the exhibition of proper treatment. The first pathological condition in typhoid fever is irritation and hyperemia of the intestinal follicles. If correct homeopathic treatment is instituted during this stage it is easy to understand how, in a fair proportion of cases, the inflammatory process may be so abbreviated that the regular course of the disease will be interfered with or aborted, in so far as eventual ulceration and sloughing of mucous patches are con-

cerned. While generally recognized as a self-limited disease, with a regular course to pursue and certain typical stages to follow, yet I am quite convinced by careful observation that well directed treatment does frequently abort typhoid fever, and also that even where this result is not secured the course of the disease may be modified in severity and materially shortened by medication, especially in child-life.

On the other hand, it is equally possible, and perhaps more so, to so mismanage and mal-treat this fever that its course may be prolonged and every stage aggravated. Ugly results follow upon sharp purgative treatment, administered early, and upon the administration of antipyretics with the idea of breaking the fever. The temperature may be temporarily depressed under their action, but they are, as my observation goes, certain to eventually increase the temperature by reaction, and to protract the case, thereby adding to its dangers. The habit of prescribing laxatives and purgatives to "clear the bowel" is responsible for a good many deaths. These should never be used. Scybale and constipated stools are not often found in the small intestine, and when in the cecum, colon and rectum they can be dislodged by colon flushing by plain water, or water and oil, without exciting severe intestinal peristalsis and aggravating the irritation and hyperemia already present in the follicles.

Complications.—Typhoid fever is a disease of complications and relapses. Besides the enlargement and tenderness of the spleen belonging to the febrile type, and the ulceration of the bowels which is the characteristic pathological lesion of the disease, there may be broncho-pneumonia to contend against, parotitis, various heart complications, and occasionally multiple abscesses. Hypostatic congestion of the lung, usually of the base, presents in a considerable proportion of protracted cases. Peritonitis, with or without perforation of the intestine, is also seen. This may occur through migration of the bacilli through the intestinal wall, or it may occur from lymphangitis. It may arise also from suppurating infarcts in the spleen, or from extension of suppuration of the spleen to the upper surface of the peritoneum. Most commonly it is caused by perforation of the intestine and the emptying of the contents of the bowels into the peritoneum. A general septic state of the system occurs where infiltration of the intestinal tissue is extensive, together with abscess formation.

Relapses are easily provoked during convalescence, from errors in diet, too early exposure, and occasionally in the form of unusually active recrudescence after the fever is supposed to have completely run its course. Relapses occur more acutely than in the original attack and reach a higher maximum. The rose-colored eruption re-occurs and subsides more quickly than in the original case. Relapses were formerly supposed to be more fatal than the

first attack, but it is well understood that such is not the case, unless dangerous ulceration has been present, when early perforation may occur at the site of cicatrizing ulcers.

In rare cases local paralysis is an important sequel; the sight or hearing may be affected or an arm or leg may fail; but this is generally temporary, and typhoid patients are often more robust, even after a severe attack in early life, than prior to its presence. It is even held by some observers to be a physio-pathological process, but this idea is not generally accepted and is not believed to be tenable.

Prognosis.—Typhoid fever is a grave disease. Its ratio of mortality ranges from ten to thirty per cent. under old-school treatment and domestic medication. Under proper homoeopathic treatment it is reduced at least one-half from these figures. It is a treacherous disease, and subject to complications and an exceedingly protracted course; so the prognosis should be always guarded, even in the mildest types. The prognosis in children is much better, however, than in adults. It is not one of the fatal diseases of child-life, and should not be attended by any mortality, unless complications, like peritonitis, extensive hemorrhage, paralysis of the heart, or long continued high temperature and convulsions are seen. Even with perforation of the intestine ultimate recovery is possible in children. While continued elevation of temperature at 105° or 106° is dangerous yet children bear this degree of heat much better than adults, and may recover even when the extreme temperature results in cerebral congestion and convulsions; though these always complicate the case and add to the gravity of the prognosis.

CHAPTER XXVII.

TREATMENT OF TYPHOID FEVER.

General Considerations—Hygiene—Medication—Medicines—Diet—Convalescence

General Considerations.—When a patient is threatened with typhoid fever, that is, when the system has been invaded by the bacilli typhosis and initial symptoms are showing themselves, it is folly to attempt to break up the fever by the administration of physiological doses of any drug, whether it be the *Baptisia*, *Gelsemium*, or *Veratrum viride* of the homoeopath or the coal-tar derivatives of the allopath. Especially dangerous is the administration of quinine. Nor is it permissible to prescribe quinine to

differentiate between typhoid and malarial fevers. This was formerly extensively practiced, more especially throughout the South and Southwest, and has caused the loss of many a life. Typhoid subjects dosed with quinine almost invariably assume the nervous and convulsive type of the disease. Headache will be increased, the temperature range will be higher, and the muscular jactitations and delirium, even to mania, be more violent.

Treatment should be directed toward modifying the severity of the case and shortening its duration, and not toward any sudden estoppel of its course, which cannot be accomplished, and efforts toward which are invariably harmful. It is the testimony of many careful practitioners who individualize their cases that it is possible to abort the disease, or so alter its course and modify its symptoms that a much milder type will be presented and the mortality gradually reduced. But there is neither a specific treatment in typhoid fever nor any one remedy nor half a dozen remedies that may be called abortants. *Baptisia*, which presents so clearly the typhoid state in its pathogenesis, a genuine counterpart of this disease, has been grossly abused in many a case that might have been modified by *Bryonia*, *Arisaricum*, *Natrum sulphuricum*, or *Kali phosphoricum*. In every instance the whole picture of the case should determine the selection of the remedy. Routine prescribing is never justifiable in typhoid fever, nor anywhere else for that matter. The disease requires careful individualization, and if proper pains be taken to select the remedy suited to each case, and the right hygienic measures be pursued, the mortality in child-life may be rendered practically nil.

Hygiene.—The hygienic treatment of typhoid fever will consist in the destruction, by boiling, of the bacteria in the water the patient may drink; but it is not enough to boil it and then let it stand open to become re-infected from the atmosphere; it must be bottled while hot. All animal foods administered to the typhoid patient should be well cooked in order that re-infection through this source be avoided. Plenty of pure, fresh water should be given, and sponge baths must be practiced with regularity, especially in the febrile and nervous types of the disease. The fever consumes the liquid elements of the body and the system needs large additions of water. The mouth and stomach are not in the most perfect absorbing state, hence water should be freely given in the form of baths and by enemata, though the severe shocking of the system by the application of extremely cold water, or by cold plunge baths as practiced in old school hospitals, is condemned. Rheumatism, especially of the heart-membranes, frequently results from this cause, while the liberal application of cool water to the body in the form of repeated spongings is never harmful and generally beneficial. Moderately cool enemata should be used after each diarrhetic action, as also when constipation is

present; and if the patient's intellect is sufficiently active he should be encouraged to retain cold water enemata as long as possible.

The room in which a typhoid fever patient is ill should be light and airy, its ventilation perfect. Typhoid fever patients are not likely to take cold, and the degree of combustion that is going on in the system makes plenty of oxygen necessary. In diarrhoeal cases the administration of nascent oxygen will be found one of the best methods of reducing the temperature and assisting in the elimination of urea.

All excrement from the typhoid patient should be destroyed. The stools should be burned or buried in ash heaps or lime pits, never thrown in privy vaults, on manure piles or on open soil. Neither should they be emptied in sewers in cities. The poison is rapidly developed from this cause, and thus others are made to suffer from a carelessness dire in its consequences.

The typhoid patient should be isolated for his own sake and for the sake of others, and only those who are necessary to his comfort should be admitted to the sick room. Many a patient has been killed through the kindness of friends who have come to see how he is getting along. The vital energies of the typhoid patient are being taxed to the utmost in his combat with the disease, and in his wanderings and delirium his best friend may appear a hideous monster. The typhoid room is no place for visitors. Only the physician, nurse and mother of the sick child should be admitted to the room. Moreover, the disease is often carried from house to house, and thus from a single case may develop a number. The nurse should wear wash goods, and all unnecessary furniture should be removed from the room, especially upholstered furniture, curtains and carpets. By preference the bed upon which a typhoid patient is to lie should be a comfortable mattress; feather beds are too heating and are certain to be ruined by the excreta. Nursing will be made easier if the bed is a narrow one, but if the case be of the nervous variety it may be necessary to have a bed of full width, to prevent the child from throwing itself off on the floor. The bed should be changed often, and for the patient's comfort he should be moved from one to another every few days in order that the mattress upon which he has been lying may be cooled and aired. When involuntary defecation occurs it will be well to put a folded bed sheet on the child as a diaper, with a padget of absorbent cotton between the nates to catch the discharge. In this way much soiling will be avoided, and the liquid parts of the feces will not cause excoriation. All excrement should be promptly removed, and the parts gently bathed and oiled with vaseline or calendulated cosmoline. If the discharges are very acrid and the excoriation is considerable a weak solution of borax water will answer a nice purpose as a bath. Attention must be

paid to the bladder. In many cases the senses are so obtunded that there is no inclination to void urine, and the bladder may become enormously distended, paresis of its walls resulting. In children it is generally sufficient to apply gentle pressure over the bladder for a period of two or three minutes consecutively, in order to prompt the voiding of the urine. Force should not be applied too vigorously nor intermittently. Cloths wrung from hot water laid over the bladder will secure relaxation and result in the emptying of the bladder in many cases. Such cloths should be hot and heavy, thus securing a combination of heat and weight. If these simple measures fail, and the indicated remedy is not sufficiently prompt in its action, the infant catheter is to be employed. The domestic practice of prescribing watermelon-seed tea in these cases is a fallacy; the kidneys are not likely to be involved, the trouble lying in the bladder, and diuretics only add to the discomfort of the patient, by increasing the activity of the kidneys and consequent bladder distension.

Headache and delirium may be overcome or modified in individual cases by the free use of cold applications to the head, as in cholera infantum and other diseases in which cerebral symptoms are likely to develop. The simple use of cold water, or the rubber-coil cap is advised, but the application of ice bags is prescribed. It is well in all cases of continued fever, especially typical typhoid, to cut the hair close. It will be lost anyway, and not only is the strength necessary to its support needed by the patient but the continued heat imparted to the head by it is objectionable.

Medication.—The remedies that will be found useful in the treatment of typhoid fever are legion. Of necessity its treatment must be symptomatic to be successful. While the anatomical lesion of typhoid is in the glands of the small intestines, and while it would seem to be philosophical to direct medication to this state primarily, yet as a matter of fact it is often remote symptoms and pathological states attendant upon typhoid that are most important. Treatment will at first and naturally be directed toward the irritation and oncoming inflammation of the intestinal follicles. But when the pathological process belonging to this state shall have become fully established it may be necessary to treat reflex symptoms that give most trouble and endanger life. *Arsenicum* presents more clearly the typhoid picture throughout its entire course than perhaps any other one remedy. *Naptina*, *Ferrum phosphoricum*, *Veratrum viride*, *Gelsemium*, *Bryonia* and *Belladonna* cover the first or irritation stage. *Bryonia* is also useful throughout the whole course of the disease. *Arsenicum* is more likely to be needed after the ulcerative stage is reached. *Lachesis* is especially applicable, along with *Arsenicum*, in blood disorganizing types, while *Belladonna*, *Stramonium*, *Hycocyanus*, *Coffea*, *Glauber's* and *Morhu* are called for in the nervous exaltations

and cerebral symptoms common to typhoid. *Phosphorus*, *Bryonia*, *Stibium* and *Arsenicum* are more needed in the broncho-pneumonic complications; while *Rhus tox.* is a handmaid with *Arsenicum* and *Bryonia* throughout the whole course of the disease. It is especially useful in the ulcerative type and low typhoid state. Although alternation is never justifiable, lacking in scientific accuracy, more reputation was made for homeopathy throughout the west and northwest in the early part of this generation by the use of *Bryonia* and *Rhus tox.* used alternately in typhoid diseases than from any other one remedial agent or combination of remedies. I have found *Gelsemium* in the thirtieth attenuation to be one of the first remedies for the reduction of the fever and for the nervous symptoms of the disease in children. But generally its type is not distinctly typhoid, being masked by malarial manifestations. Here this remedy is perhaps more often called for than any other unless it be *Arsenicum*.

Beginning at the beginning, when the earliest manifestations of fever show themselves, we will probably have to select between *Baptisia*, *Bryonia*, *Gelsemium*, and *Ferrum phosphoricum*.

Baptisia presents profound prostration from the start. The child is "so tired." It lies languid, indifferent to its surroundings, with flushed face, besotted expression, tongue brownish-white and heavily coated, breath fetid, diarrhea which is very offensive and of yellowish-watery or greenish-watery character. The pulse is compressible, though more rapid than it should be, and the axillary temperature shows continuous increase of a degree or more from the time the first symptoms are introduced. In this type of case *Baptisia* will be found to be the similimum. The mistake has been made of using it in the low attenuations. It was formerly my custom to purchase the tincture by the half pound, but I have learned better. The sixth, twelfth and thirtieth potencies meet the necessities of typhoid fever in children much better than the lower attenuations or the crude drug. The lower often increase the typhoid state, exciting the nervous system and assisting in the disorganization of the blood. If *Baptisia* is indicated it should be given alone, and not too often repeated. One individual symptom of *Baptisia* is expressed in the patient's fancy of his double being in bed with him, or of his members being scattered about the bed.

Bryonia.—This is a remedy presenting a more acute picture than *Baptisia*. The patient complains more, his headache is harder and is of a throbbing, bursting character. His muscles are sore and his joints ache. Constipation is present instead of diarrhea, though the latter may occur especially in the fall season of the year, when the days are hot and the nights are cold. The *Baptisia* patient lies quiet because prostrated, while the *Bryonia* patient lies quiet because it hurts him to move. The spleen and liver are

sore in the *Bryonia* patient, the fever is more acute, the skin is hotter and dryer, and there is more thirst and less of fetor than with *Baptisia*. With *Bryonia* the bowels are early tympanic. The petechiæ are slow in appearing, and the mucous membrane of the respiratory tract has dry, hacking cough and pain upon breathing. The *Bryonia* subject has stitches under his right shoulder blade and in his right side, with painful hepatic enlargement.

Gelsemium is more likely to be useful if the child is heated, the skin moist, the cheeks flushed, the face and head hot, the back of the head and neck especially being hot and painful. The neck feels drawn; aching of the muscles of the neck and down the spine between the shoulders. The child is stupid because of the heat of the head; the pulse is accelerated and the temperature rises three or four degrees. Delirium occurs early, but is passive in character. Torpor is more likely to characterize the case, but there is not the prostration of *Baptisia*. *Gelsemium* is especially useful in children. If the bowel characteristics are pronounced this remedy will not be needed. It is more applicable to the acute febrile type, with mild cerebral involvement. In young children it is sometimes demanded by the convulsions of passive congestion of the brain. It is more especially applicable in the mixed types of fever, where there is an intermingling of fever and malarial symptoms. Is more useful in the fevers occurring in the early fall than those of late autumn and winter.

Ferrum phosphoricum is the *Acute* of typhoid fever. In symptoms like those of *Acute* in simpler fevers this remedy will serve a good purpose. The fever is more acute; there is more of restlessness, frontal headache, flushes of the face, thirst and heat. There is not the pain in the back of the head and neck, nor the intermingling of malarial and typhoid symptoms of *Gelsemium*. The case is ushered in with chilliness intermingled with heat, and the prostration is as pronounced as the fever. The latter is more acute in character and the prostration is less than that calling for *Baptisia*. The stomach is nauseated, and vomiting may be present. Hemorrhage of the nose occurs in connection with congestive headache; and if there are speckings of blood in the stools in the earlier stage of the fever, showing intense congestion of the intestinal follicles, *Ferrum phosphoricum* will be found useful.

Acute is by no means barred, but is not so likely to be demanded in the acute febrile stage of typhoid fever as in similar stages of pneumonia, meningitis, acute rheumatism and febrile conditions generally. It is useful in typhoid if there is a highly excited state of the nervous system; the fever is intensely hot and the child nervous and restless, with thirst and delirium. In the insomnia of typhoid, and in the restless state that sometimes attends it, *Acute* is one of the most useful of medicines, no matter what stage of the disease. I have used it much more successfully

as an intercurrent symptomatic remedy than against the fever in the earlier stages.

Belladonna is not often called for in typhoid fevers among adults, but in children is very useful. The congestion is pronounced; the head and trunk are intensely hot, the feet and hands cold; the child is delirious from the start. Its pupils are dilated, its eyes injected, face flushed, the carotids throbbing and pulsating forcibly. Retention of the urine occurs; the cerebral symptoms are marked, and tonic convulsions are associated with an inflammatory state of the bowel during the intensity of the fever.

Veratrum viride is also to be thought of in connection with the congestive stage of this fever, especially when hypostatic congestion of the lung occurs. The pulse is full, strong, bounding, possibly without the sharpness of stroke of *Aconite*. As with *Ferrum phosphoricum* the face is mottled, the head hot and capillary stasis grows very pronounced, even to darkness of the petechiæ; cough dry and irritating, with pain throughout the chest. The applicability of *Veratrum viride* is quite limited. It will rarely be needed except when associated with congestion of the lungs and passive congestion of the brain.

Rhus tox is a typhoid remedy par excellence. It is more especially applicable in the fall season in subjects of mild delirium, whose cases are ushered in by dry, burning heat, nosebleed, rigidity of the nape of the neck, and evening exacerbations of the fever. There is aching of the limbs and great soreness of the muscles. The bed seems too hard; the child feels so tired of it that it wants to be held. The muscles of its scalp and neck are so sore that the pillow seems too hard. *Rhus tox* affects the nervous system, has delirium, nervous jactitations, subsultus, chronic rigidity of the forearms, hands and feet. Tongue red all over, very red and dry at the tip, with papillæ standing out unusually bright. Diarrhœa occurs at night; the fever is worse at night; the delirium is more active at night. There is nervous restlessness and tossing, with picking at the fingers and bed clothes. The petechiæ are slow in making their appearance, and the whole course of the case is protracted. Mental operations are difficult. The patient protrudes his tongue with difficulty, and is slow in responding. There is not the tympanites of *Bryonia*, but there is tenderness in the ilio-cæcal region, with gurgling under the fingers upon pressure, followed by a diarrhœic evacuation, the diarrhœa being dark and offensive. The delirium of *Rhus tox* is less violent than that of *Belladonna*, *Gelsemium* or *Bryonia*. As against the latter remedy there is more restlessness and muscular soreness, especially of the back of the head and neck, with aching of the joints. The fever comes up at night, and as it rises there is a teasing, tickling cough. The *Bryonia* patient prefers to lie

quiet, the headache is more in front of the head and temples and is of a throbbing, bursting character. The tympanites is more pronounced, and constipation is the rule. The cough of *Bryonia* is not as especially associated with rise of fever as that of *Rhus tox.* The delirium of *Rhus tox.* is not pronounced. Is of a low muttering type; there is more of mental hebetude, while with *Bryonia* the delirium is more active and the patient tries to get away; thinks he is confined in the wrong house and wants to go home; if the patient is a young child he talks about his toys, plays and games; if a youth, about his school duties and studies; if an adult, about his business; delirium relates to what is uppermost in the mind at the time the illness comes on. This is *Bryonia* always.

Arsenicum is considered by Baehr to be the most reliable remedy in typhoid. Cases that call for it are closely akin to *Rhus* in their symptomatology. The stools have an exceedingly foul odor, the fever is intense, the patient is restless and there is nervous prostration and exhaustion. The lips, gums and teeth are covered with sordes, and the tongue is cracked, dry and stiff. The mouth and gums are sore and bleed easily. *Arsenicum* is more useful in the ulcerative stage, with tympanites, diarrhea, and pronounced tenderness in the ilio-cæcal region. Restlessness precedes and exhaustion follows copious, greenish, watery, gushing stools. *Arsenicum* is suited to the most putrid types, with profound prostration, hippocratic expression, features sunken, dark circles under the eyes, weak, rapid and filiform pulse. The *Arsenicum* patient is worse at night, aggravations occurring about 3 o'clock in the morning, the patient being more delirious and excited from midnight to that hour, with likelihood of there being more prostration from that time on. The *Arsenicum* case is severe from the start, the emaciation is rapid, and a combination of restlessness and exhaustion completes the picture.

Arnica is not used with sufficient frequency. It has the soreness of the muscular system, depressed feeling all over, petechiæ, spots of ecchymosis, foul-smelling breath, and profound debility. It also has a brown streak down the middle of the tongue, soreness and heat of the abdomen, with distension and rumbling, followed by offensive, gushing stools. *Arnica* is more like *Rhus* in its symptoms, but the patient is not so restless, nor are the nightly aggravations so characteristic. In cases characterized by stupor, with low muttering delirium, and discolorations of the skin, especially of parts lain upon, *Arnica* will be found a useful remedy.

Terebinthina.—Turpentine is among the most useful remedies in the second week of the disease and will occasionally be found helpful earlier, and also later. Its characteristics are extreme tympanites, with soreness of the abdomen, the tongue very red and

glistening, the urine thick and scanty and burning upon being voided. Bio-cereal tenderness and gurgling are pronounced, and hemorrhage occurs from the bowels, with or without diarrhetic stools. The red, shiny tongue, tympanitic, dysenteric and urinary symptoms will, together, call for *Terebinthina*.

Phosphorus is applicable to the adynamic type and is especially useful when there is pulmonary congestion, even to pneumonia. The patient is exhausted and the liver and spleen are very sore and enlarged. Involuntary stools occur, with complete relaxation of the anus. The petechiae are plentiful, and during delirium the patient tries to escape but is too exhausted to finish the effort. *Phosphorus* is especially suited to the hemorrhagic variety as well as to the pulmonic state. Bleeding occurs from the mouth, nose and bowels. *Phosphorus* is also indicated when nausea is present during the first week of the disease. Vomiting of bilious, slimy, watery masses. Water is vomited as soon as it becomes warm on the stomach. *Phosphorus* is especially useful in hypostatic congestion of the lungs. It is more likely to be demanded in slender subjects with sandy hair and predisposition to lung troubles.

Kali phosphoricum is suited to low typhoid states, with profound exhaustion. There is constipation during the course of the disease, debility, weak heart action, putrid breath, offensive stools, and sordes on the lips, teeth and tongue. It is especially applicable to the blood disorganizing state of typhoid, with great putridity of all the discharges. In this it is very much like *Arsenicum*, but it lacks the restlessness of that remedy, and its typical state is one of profound debility rather than of pronounced collapse.

Muriatic acid.—This acid is especially useful in the third stage of the typhoid state, when muscular paresis is pronounced. The patient settles down in bed, is unconscious, even when awake, and pays no attention to movements of his kidneys and bowels. Involuntary discharges of dark, offensive diarrhea; constant settling down in bed; relaxation of the entire muscular system. Tongue heavily coated and paralyzed; inability to protrude it. In the low, sunken, prostrated condition belonging to the third stage of typhoid *Muriatic acid* compares with *Arsenicum*, *Kali phosphoricum* and *Lachesis*. The patient is so debilitated that his lower jaw hangs and the eyes are rolled upward; the arms hang lifeless at the sides, and the contents of the bowels pour away continuously by reason of the muscular relaxation.

Lycopodium is especially applicable where the rash is slow in appearing or fails to appear, and the patient is sunken in an unconscious state. Cerebral paralysis; patient lies in a stupor, lower jaw drops and hangs, as with *Muriatic acid*. Head and body hot, with feet cold. Abdomen enormously distended. Low muttering delirium with picking at flocks. With children the characteristic red sand seen in the urine is nearly always seen in the *Lycopodium*.

typhoid case. Its subjects are unhealthy children who are emaciated and wan, with chronic and infantile dyspepsia and tendency to constipation.

Opium will be called for when the patient is so stupid that he cannot be aroused. Unconsciousness, delirium, body bathed in hot sweat.

Parisian will occasionally meet the extreme putridity of typhoid diarrhea, and will often be helpful in convulsions in unusually protracted cases.

Nitric acid is especially to be thought of in connection with hemorrhage from the bowels occurring during the ulcerative stage.

Lacina meets individual cases of cerebral typhoid whose symptoms are all aggravated after sleeping, and profound disorganization of the blood, with prostration both of the mind and body and general relaxation of the muscular system.

Hyoscyamus is especially useful where hallucinations and delusions predominate. The fever is intense, and nervous exhaustion pronounced. Retention of urine with nervous restlessness. Subulitus tendinum and nervous jartitations.

Stramonium.—Slight delirium and clonic spasms. Maniacal attacks; patient tries to bite and scratch his attendants. Children who are ordinarily passive and of pleasant disposition become highly vehement and vicious in their actions and rave like wild. The stages of excitement are followed by loss of consciousness and imbecility.

Apis mellifica is especially useful where the urinary system is involved; retention of urine, or involuntary urination; burning, hot, scalding urine chafing the skin. The roscola is well developed. Hydrocephaloid symptoms in young children, as sharp, sudden, piercing cries, with threatened convulsions, call for *Apis*.

China may be found useful in hemorrhagic types, with symptoms of malarial complication.

Carbo vegetabilis is especially applicable in the profound prostration of the last stage; patient in state of collapse; breath hot, with cold sweat, hippocratic face and small, thready pulse. Not often beneficial in the earlier stages, *Carbo vegetabilis* is a remedy of first importance in the collapsing crisis of typhoid fever.

Pyrogenium, *Iguatia*, *Cofea*, *Moschus* and *Nux moschata* may be demanded for the nervous restlessness and insomnia of the fever.

Digitalis, *Cactus*, *Lycopodium* and *Calcarea* may have to be used to meet heart complications that occasionally arise.

Mercarius solubilis, *Iris versicolor*, *Natrum muriaticum*, *Mercerius vivus*, *Nux vomica* and *Leptandria* may be studied to advantage in connection with the bilious symptoms of typho-malarial fevers. Other remedies may be demanded for special symptoms and conditions that may arise during the course of this protracted and

treacherous disease. As a rule it is good treatment to carefully select the basic remedy, that is, the one meeting more nearly the totality of symptoms, including the general physio-pathological condition of the patient, and adhere to it closely, not changing remedies often nor repeating doses frequently. The disease is a protracted one, and it is impossible to impress it suddenly or permanently with any single remedy; but the proper remedy continued over a number of days, at moderate intervals, will accomplish better results than frequently repeated doses, or than different remedies, perhaps carelessly selected. The symptoms that are present in typhoid fever are legion, and if it be undertaken to meet them all the task will be a difficult one. The complete picture should be carefully fixed in mind, and the basic remedy selected with precision and followed closely over a sufficient period of time to enable it to make its impression upon the disease, intercurrent remedies being given as absolutely necessary for special disorders or dangerous symptoms.

MENSTRUUM.—Medicine given to typhoid subjects should be prepared in water that has been boiled and immediately sealed. It is a mistake to prepare medicines in open glasses or cups partly full of water, leaving them to stand, perhaps carelessly covered or not covered at all. If the mouth and tongue are not too dry it is better to administer the remedies in the form of powder or tiny pellets than to use alcoholic dilutions of the medicine, alcohol being apt to add to the irritation in susceptible subjects, a class to which most young children belong. If it be desired to administer the remedies in liquids it is better to add the medicine to a few ounces of water and keep it sealed in a perfectly closed bottle, from which it is taken only at the time of administration. This bottle may be kept on or near the ice, or standing in a vessel of cool water, in order to keep it from scorching or becoming stale to the taste. I believe it to be a mistake to add a teaspoonful or even a half teaspoonful of an alcoholic dilution to a third or half glass of water, of which a teaspoonful or more is to be administered every hour or two, as is often the routine practice. There is no need for hurry in typhoid fever, for the disease has a set course to run and the best we can hope to do is to modify its symptoms, direct its course somewhat, and guide the patient safely through its fire. It is not necessary to repeat medicines often, and if the proper remedy be selected it should be repeated only when the indications point to a cessation of action of the dose given. Efforts to terminate typhoid fever by crisis are far more hazardous than to let it down gradually by lysis.

Even though the patient's mouth be very dry, too dry to readily absorb medicines administered in the dry forms, it will often be better to so administer them, following their administration with a swallow or two of sterilized water, than to give them in alco-

holistic form or to prepare them far ahead of the time of administration, thus subjecting them to souring.

As a rule the medium, sixth to thirtieth, potencies will be found better than lower strengths. *Sulphur, Calcarea, Proximum, Thuja, Silica*, or other antipsoric should be given higher and not often repeated.

Diet.—More typhoid fever patients are overfed than underfed. It is a mistake to crowd nourishment into a stomach and intestines that are not able to properly digest and assimilate it. During typhoid fever all the functions are altered. Commencing in the mouth, the saliva is viscid, decreased in quantity, and because of the soreness of the lips and tip of the tongue the patient is not able to properly masticate, and thus insalivate his food; the mucous membrane of the stomach is hyperemic, the gastric juice is secreted in deficient quantity and is altered in character; the intestinal juices are altered also, while bile is secreted in less quantity and is thicker and more viscid than normal; hence it is not possible for digestion to be carried on naturally. Whenever food is given it should be given at regular intervals, in moderate quantity and of such character as to be taken into the stomach by absorption with the least possible amount of digestive effort. Children require but very little nourishment during the course of this disease, unless it be unusually protracted. Three or four ounces of liquid nourishment, such as pasteurized milk, koumyss, barley-water, or weak mutton-broth made in an open vessel, may be administered every four or five hours. In many cases children do not need even this quantity of food; more than once have I carried a child over an attack of ordinary severity with less than half a pint of milk in twenty-four hours. It is remarkable how little food is demanded in young subjects if the system be freely supplied with water; and when it is taken into consideration that a great deal of combustion is going on, and that all the excretories of the system are engaged in the elimination of debris, it will be seen that it is unwise to add to their labors by compelling them to do the additional work of digesting food. The liver already has all the work it can do, while the intestinal follicles are in a hyperemic state, and the tendency is to ulceration and, in most cases, an outflow of blood-serum. Forced feeding may be required in prolonged attacks, but in cases of moderate severity the less nourishment that is forced upon the child the better for it. Should the case be of the stupid variety, without severe inflammation of the digestive organs, it may be best not to rely upon the patient's demands for food, since he pays no attention to his wants, not even calling for water though his mouth be as dry as a chip; but, as a rule, it is better to allow nature to assert herself and call for nourishment as needed rather than to indulge the habit of feeding indiscriminately.

Milk has long formed the basis of nourishment for typhoid subjects, both children and adults, but I confess to the conviction that it is not the best food. The coagulability and indigestibility of its casein have been sufficiently discussed in the chapter on infant feeding, but it is proper to add that the heated condition of the blood results in the absorption of the watery elements of the milk without correspondingly separate absorption of its solids. These form in cheesy masses into intestinal scybala, which irritate the already inflamed follicles and assist in causing ulceration. Even though milk be passed fairly well through stomach and intestinal digestion it often accumulates in clay-like masses in the large bowel, necessitating straining efforts at stool which are productive of intestinal hyperemia and increased cerebral engorgement. An additional objection offers against milk being used as a typhoid fever food. It is well understood that a number of varieties of bacteria are found in cow's milk. These may assist in the segmentation of the curd, but if the secretions of the stomach and duodenum are considerably changed by the heated state of the system this process becomes one of putrefactive fermentation, and to the already existing disturbed condition of the functions is added infantile dyspepsia, with increased distension, greater abdominal pain, flatulence, and, as a natural consequence, increased inflammation of the intestine. I have long since ceased to use boiled milk as an article of diet in the typhoid room. Recent investigation goes to show that the preparations of maltose are superior to milk, are richer in nitrogenous elements, and that the system is spared the labor of transforming the lactose into maltose and subsequently into dextrine when this type of food is given. Acting upon this philosophy it is recognized that Mellin's Food, which, as has been shown (see Infant Feeding), is made according to the formula of Liebig, and buttermilk should be made the basis of nourishment during typhoid fever in children. If, for any reason, these preparations do not seem to afford the child sufficient support it may be well to add to the selected prepared food pasteurized milk in proportions to suit the demands of individual cases. Raw milk should be religiously eschewed, and boiled milk is not much better.

Buttermilk offers a most excellent food for typhoid patients. The casein and fat have been largely eliminated in the butter-making process, and lactic acid fermentation, which must be carried on in the stomach if milk is given fresh, has already been done. It is with most children a grateful drink, and if strained through two or three thicknesses of cheese cloth, in order that whatever fat remains in the butter globules shall be extracted from the milk, affords safe refreshment. Even if children have a distaste for it they will take it readily as they become hungry, and it is much better to select an article of diet that is suited to their needs

than to rely upon their likes and dislikes. No greater act of unkindness can be practiced in the sick-room than to depend upon the wishes of the child as to its food, wishes whose subservance may result in additional weeks of illness.

Beef tea as ordinarily made is an abomination. The regulation domestic method is to chop lean beef into fine bits and put an ounce or two of it in a bottle fairly well covered with fresh water, cork the bottle and place it in cold water in a vessel, the encompassing water being then brought to a boil. By boiling it a long time the juice is drawn from the meat and is generally considered very nourishing, whereas, as a matter of fact, it is one of the most innutritious and irritating articles of diet of the sick room. The muscle salts are extracted from the fibre and serum and unfortunately are not allowed to escape, as they do in good part by the stewing of the meat in an open vessel. Meat juice thus prepared is highly charged with muriate of potash, with the result that upon being fed to the typhoid patient the nervous condition is always increased, the temperature elevated from two to three degrees, the condition otherwise aggravated and the fever prolonged. If meat must be given it should be prepared in an open stew-pan; tender, lean beef should be chopped very fine or its pulp scraped from the fibres until a sufficient quantity has been obtained to prepare the necessary stew. To two ounces of meat pulp is added a quart of water, cold. It is placed on the cook stove and slowly brought to a simmer, at which temperature it is kept for an hour, with repeated skimmings of the liquid, at the end of that time being brought sharply to a boil for a minute or more. It is then strained and put in a tightly closed vessel in order to prevent infection from the atmosphere, bouillon affording an excellent medium for the cultivation of disease germs. When used, this kind of beef tea or broth may be flavored with a little salt and given in moderation, a few teaspoonfuls as often as every four hours. Children from six years up who have been hearty feeders seem sometimes to require more nourishment than children of more tender years and those who are less vigorous and hearty. In these subjects the beef tea of the open stew pan, pasteurized milk, which may be subjected to the peptonizing process as well, Malted Milk, Mellin's Food, and in rare cases a few drops of Baccine added to the milk preparations will afford quite a liberal diet. It is not always best to keep a sick child on a single article of diet long at a time. The appetite soon tires of one kind of food, whether the subject be sick or well. On the other hand it is not safe to make frequent radical changes in the diet of typhoid subjects. The less food they take the better. The more water they drink the better, and the more water they are given by the external and internal bath the better.

Fruits may be used sparingly during a long course of illness from fever. Nothing is more grateful to the child than an occasional taste of the scraped pulp of a thoroughly ripe and juicy apple. To give it in chunks is but to increase the irritation of the intestines and make the child worse. To scrape it, seeing that its particles are rendered exceedingly fine before administering it, is to confer a favor that will almost invariably be appreciated. The occasional administration of small quantities of the juice of ripe oranges is also permissible. Lemons are too sharp, and orangeade sweetened only with grape sugar, never with cane sugar, is to be preferred to lemonade. If oranges are not to be had a pleasant drink may be made from juicy apples or from the pineapple; the juice of the latter is grateful to fever subjects and is always permissible, its pulp never. Bananas are treacherous, and grapes are dangerous. The degree of alcoholic fermentation which the latter produce is certain to increase the fever. I have known a number of cases of typhoid fever to relapse from eating grapes, and saw two fatal cases in one family from this cause.

No matter what form of diet is selected for the typhoid fever child the nourishment should be administered according to the manifest necessities of the case rather than by the clock. There is neither reason nor the exhibition of good sense in giving medicines or food just because the hands of the clock are seen to be opposite certain figures on the dial. It may be very reasonable to suggest the necessity of thorough system in feeding typhoid subjects, but with this disease, as with all others, individual patients have individual idiosyncrasies. What is one's food is another's poison, and what is one's feeding time is another's time for rest. The specific indications for the administration of nourishment must depend upon the state of the pulse and the condition of the digestive organs; this will be reflected in the mouth and general condition of the system. If there be a high state of nervous exaltation the exhibition of food is almost certain to increase it, even to the precipitation of convulsions. If on the other hand there is active diarrhea, the intestinal membrane is not in an absorbing condition, and no matter how much food is poured into the stomach it cannot be digested and assimilated, and, therefore, serves only to increase the irritation. If the diarrhea be profound the nourishment must be so liquid as to be absorbed rather than digested, and must be given repeatedly but in small quantities.

The refreshment of typhoid children should consist largely of water, pure water, water that has been sterilized by boiling and that has been cooled on or near the ice. Ice should never be added to the water the typhoid subject drinks, nor should water be administered ice cold. Cool water may be given freely; ice cold water is almost certain to demand the exhibition of *Artemisium*.

In country practice it is considered desirable to give typhoid fever subjects plenty of fresh water right from the spring or deep well. This is a mistake. The spring from which water is taken may be contaminated at its fountain source, and no matter how pure and sparkling it appears may be the carrier of deadly poison. The same is true of a well. The deeper the well the safer as a rule, yet deep wells may be contaminated by surface seepage, even being the cesspool of a manure pile or neighboring privy vault. In the country as in the city the drinking water of the typhoid subject and the water his medicines are prepared in, the water in which his fruit drinks are prepared, and in which his various dietetic preparations are held in solution, should invariably be boiled. If ice is not kept on the premises water may be cooled by being suspended in the well or spring from which it was obtained before being boiled.

The administration of alcohol in any form during typhoid fever in children is highly objectionable. I cannot imagine a condition in which it is helpful. Following severe hemorrhages or copious diarrhœa it serves rather as an irritant than as a stimulant, in the proper sense of the word. When it appears to be called for according to the usual indications it is far better to administer a few teaspoonfuls of hot, pure water, the hot beef-broth previously spoken of, or equal proportions of hot water and hot milk. Either of these serves to stimulate the stomach and excite reaction as well as the alcoholic preparations, and all are free from the objections that pertain to the use of alcohol; the latter increases the entire irritation, excites the heart's action, causes more rapid congestion, and while it may seem at times to assist in riding the crisis this can be better accomplished by the administration of that which is at the same time nourishing, and by the use of the proper homeopathic remedy.

If it is felt that it must be given it is better to administer it by external application, adding it to the bath, applying it especially in the arm-pits and groin. I have learned, however, to discard it altogether, as conducive of cerebral irritation, nervous excitation and increase of temperature with secondary depression of the vital forces.

Convalescence.—Typhoid fever is a treacherous disease and it is very necessary to guard carefully against recrudescence and relapses. In special cases it is usually many weeks before the patient will have sufficiently recovered his nervous tone and digestive vigor to be able to engage in the games of child-life, his school duties, if he be of scholastic age, and to return to a variable table-diet. Should the fever leave by crisis the utmost of care will be necessary after its subsidence in the administration of food; the diet which has been practiced in the sick-room should be continued religiously until reaction is well established. Though it may

be safe to vary the diet somewhat by permitting the use of oyster-broth in season, small bits of tender mutton chops, and, later, finely chopped or the scraped pulp of rare beef. Chicken is among the most treacherous of all sick-room diets as also of the diets of convalescence; but it is proper to give the dry white meat of young fowl, and even the dark meat if perfectly free of fat, in moderate quantity after the first week of convalescence, not earlier. Thoroughly baked potato may be added within a few days, and dipped toast from genuine stale bread is also permissible. Fresh bread should not be allowed for a month after typhoid fever, and hot bread should be tabooed throughout child-life. A little beef-steak and thoroughly cooked rice are permissible at the end of the first week, or at the furthest at the end of the second. The greatest of caution is necessary lest the indulgent parent or careless nurse respond to the ravenous cravings of the child and by engorging his stomach through a supposed act of kindness bring him to or hurry him through death's door. If diarrhea supervene upon an attack of typhoid fever the diet will have to be governed accordingly. If constipation is present the juices of meats and pulp of apple, free from rinds, seeds and core are a grateful variety. Sago, tapioca, various preparations of farina, and, later, oatmeal and soups made from tender young peas or thoroughly cooked lentils that have been strained so as to be free of all husks and refuse, may be added to the dietary. Not until at least fourteen days have passed after the subsidence of the fever and the introduction of the patient upon the stage of convalescence will it be safe to digress very much from the foregoing diet list; and after all, if the cook understands his business, and if variation be practiced, a sufficient dietary has been outlined to meet the necessities of child-life for many weeks.

Common sense will dictate in the matter of exercise and clothing and general habits. Typhoid subjects are often weak and anemic, and if exposed too soon to inclement weather are liable to contract bronchitis or pneumonia. If too active exercise is indulged in attacks of dyspepsia are apt to occur. Convalescence is sometimes prompt but more often is tedious, and it is better to err on the safe side by being very cautious than to run the risk of inviting a relapse or unnecessarily protracting the convalescent stage.

CHAPTER XXVIII.

YELLOW FEVER.

General Considerations—Locale—Etiology—Symptoms and Course—Signs—
Diagnosis—Prognosis—Prophylaxis—Treatment—Nursing—Diet—Medica-
tion—Keynotes.

General Considerations.—While not especially a disease of childhood, yet in recent epidemics yellow fever has attacked children with unusual virulence. Prior to the devastating epidemic of this disease that visited the Southern portion of the United States in 1878 it was considered that children were rather more exempt than adults; in fact, it was accounted quite unusual for children under five or six years of age to die from yellow fever. But in that epidemic anomalous situations were presented; not only were children stricken, but negroes, who were also supposed to be more exempt, were attacked almost as commonly as whites. In my experience as a volunteer physician at Chattanooga during the epidemic mentioned I met with a number of cases of yellow fever among young subjects, although, be it said, the malignancy of the disease was not so pronounced, nor was the mortality as great as in adults. In the report of the Homeopathic Yellow Fever Commission, created by Dr. Conrad Wesselhacht, president of the American Institute of Homeopathy, concerning the general course and history of the epidemic of that year, it is recorded that "It attacked children under fifteen years of age in extraordinary numbers, that class making at least one-third of all the cases of yellow fever during the epidemic." In a recent letter, Dr. Orme, of Atlanta, who was a member of that Commission, suggests that "Possibly the increased proportion of children attacked may have been due in part to the fact that many adults had suffered from the fever in previous years while the children were fresh and unprotected material." Be that as it may, it is now well understood that violent epidemics of yellow fever cause the death of many children of tender years, and also of many youths.

Locale.—Yellow fever is an acute, febrile disease seen in tropical and semi-tropical countries. It is occasionally imported into the United States and Canada, and prevails endemically in the West Indies and in certain portions of South America and Southern Mexico. It is seen epidemically in certain sections of South America, and a number of very severe epidemics have occurred in the Southern portions of the United States. Epidemics attacking this country with unusual severity are those of 1853, 1867, 1873,

and 1878-1879. In 1876 it was very bad in Savannah and Brunswick. Later and milder epidemics have been seen at Brunswick, Georgia, and at Pensacola and Jacksonville, Florida. Boston, Baltimore, Quebec and other northern cities have suffered from yellow fever but it has never prevailed in these cities with malignant epidemicity as in the South. Its focal zone, from which it is said never to be absent, includes Havana, Vera Cruz, Rio de Janeiro, and other Spanish-American ports. There is also a peri-focal zone, or region of protracted epidemics, which includes various ports of all the tropical Atlantic coast in America and Africa. There is also a zone of accidental epidemics which Guiteras describes as lying between the latitude parallels of 45° North and 45° South.

While more commonly seen at or near sea level it has prevailed epidemically at altitudes of several thousand feet. New Castle, Jamaica, 4,000 feet above sea level, suffered a devastating epidemic, and Humboldt saw yellow fever at 2,500 feet above the sea in Mexico, Holly Springs, Granada, and other high points suffered severely in 1878. Though commonly introduced at sea-ports it may prevail epidemically at almost any altitude if the conditions and seasons are favorable.

The disease is introduced into the United States and into countries to which it is naturally a stranger by the influence of its specific poison, chiefly through articles that have become infected. It has also been introduced by individuals suffering with the disease, but the danger from this source is nothing as compared with the danger from woolen goods, baled stuffs and cargoes of fruit that are imported from ports in which the disease is prevailing epidemically.

In speaking of its possible prevention, Ormæ says, "It should be borne in mind that it is in dark and close places that the germs of the disease are propagated. While an infectious disease, it does not class with the contagious which reproduce themselves in the body of the subject. The luggage and not the person is what is dangerous in the case of one from an infected district, and it is particularly to be borne in mind that ventilating a house after frost at the close of an epidemic season will not afford immunity to returning refugees unless the closets, trunks, chests, drawers and all closed places and packed-away clothing be thoroughly exposed. There is more danger in opening a small, closed package of clothing or other material sent from a city in which the atmosphere is infected than in shaking hands with a regiment of people from a similar place."

Yellow fever attacks people of all races and spares no age. The negro, however, is much less susceptible than the white race; in fact, in former years but little effort was made to protect the black race because of its accepted immunity. Persons who are

permanently resident in tropical or semi-tropical countries are less likely to contract the disease, even when it is prevailing epidemically, than are temporary residents. Young children are not often attacked in epidemics of moderate severity and where the disease prevails endemically; but in vicious epidemics, and especially in countries in which epidemics occur at long intervals, children suffer, perhaps, more than adults. Guiteras charges that the infant population of a country to which yellow fever is endemic affords the foci of endemicity, since they form the new material upon which it feeds. One attack of yellow fever usually secures immunity from a subsequent attack, but not invariably so. Bad hygienic surroundings favor its outbreak and unsanitary conditions generally conduce to severer epidemics and a larger mortality. When once introduced into a country where it is not indigenous there is almost certain to be an epidemic of greater or less severity; but, fortunately, even in the Southern portion of the United States, unless the conditions are extremely favorable for its development, it is not now considered difficult to keep it under moderate control and within certain circumscribed limits. Cities and towns situated on shallow bays or sluggish streams into which sewage and drainage from marshy sections of country are emptied are most likely to suffer from this disease. But it must be borne in mind that in every instance it requires the introduction of its specific causative germs from infected ports, and that it does not occur *de novo* in the United States.

Etiology.—Yellow fever is, undoubtedly, due to a specific virus, the germ of which is not at present known. Palliant, of Savannah, holds that the micro-organism of this disease is a hybrid between a vegetable and animal parasite. Sternberg, in his last report to the United States government, following upon careful investigations made in South America and the West Indies, concludes that the specific cause of yellow fever has not yet been demonstrated. Piriére, Carmona, and Gibier hold that they have discovered the micro-organism that produces yellow fever, and Piriére especially seems to be quite earnest in his claims.

Not only does the disease prevail with greater severity in sea-coast cities and towns, but it is worse in those that are badly drained, in unhealthy portions of the city, among people whose hygienic surroundings are of the worst, and is especially malignant during the hot season. In Havana the death rate is greatest during the months of June, July, and August. In the United States it occurs more severely during August, September, and October, not generally being introduced into this country early in the season. It is especially severe in seasons in which heat and humidity are associated. One or two good frosts usually suffice to kill the epidemic, it having never been known to occur in this country in the late fall or winter months, being only casually

epidemic during the winter season where it prevails throughout the year.

Symptoms and Course.—Yellow fever has a stage of incubation, varying from a day or two to two or three weeks. It is not apt to be marked by a pronounced prodrome, although in exceptional cases a certain degree of languor and physical prostration, with headache, loss of appetite, and general malaise, may antedate the outcoming of fever. As a rule, however, it is ushered in suddenly, with a sharply defined chill, not as severe as the chill of ague or pneumonia, quickly followed by fever, the thermometer bounding to 103° to 104° , but usually not higher. In some cases the chill is absent, or there may be but slight chilly sensations or chilliness intermingled with heat. The pulse is full and bounding, yet compressible and not over rapid, in adults from 120 to 125 per minute, in children fifteen or twenty beats faster. The pulse is not rapid and dichrotic in proportion to the severity of the general symptoms. The headache is intense, as are also the severe pains in the back and limbs in most cases. Epigastric tenderness and nausea early characterize this fever, but vomiting is rarely present in the first stage. The bowels are generally constipated, the tongue is more or less furred, the breath is sweetly fetid, the face is flushed, and the eyes are injected and watery. There is something peculiar about the expression of the eyes of the yellow-fever subject. They are not suffused as in coryza, nor intensely injected as in cerebro-spinal meningitis; there is a dreamy, suffused, mellow expression, with more or less of injection; the eyes appearing watery, even though there be no coryza. The urine is scanty, high colored, and early contains albumen.

STAGES.—This stage of invasion lasts from a few hours to two or three days and is succeeded by a remission, or stage of calm, which is deceptive. The temperature falls and the severity of the symptoms abates. The aching of the back and limbs lasts about twenty-four or thirty-six hours as a rule, especially in young subjects, and the temperature rarely exceeds 103° or 104° . As the stage of calm sets in it falls to nearly normal, the epigastric tenderness is relieved, the headache subsides, and the patient feels that he is passing into convalescence. In mild cases this really occurs, and there is an absence of the second febrile stage, which is really the third stage, with its vomiting, jaundice, suppression of urine, hemorrhages and other malignant symptoms. The stage of calm may last thirty-six to forty-eight hours, when there will suddenly develop a rise in temperature, a return of the headache, a decrease in the quantity of the urine, quick development of jaundice, a return of the nausea, and setting in of vomiting. Where the characteristic "black vomit" of yellow fever occurs there will be ejected from the stomach a grumous fluid consisting

of blood and gastric mucus, more or less altered by the gastric juices of the stomach. This black vomit is considered quite characteristic of yellow fever, but it may occur in profound alcoholism, in purpura hemorrhagica, and in malignant diphtheria; it is also seen in dengue fever and in numerous blood-poisoning states. In the black vomit of yellow fever there are blood corpuscles, epithelial cells, altered gastric juices, portions of food and various fungi. The vomiting may be attended by severe pain and retching; or it may be sudden and spurring in character and not attended by unusual distress. Jaundice, from which the disease gets its name, is nearly always present in adults in the third stage of yellow fever, and is occasionally seen in children, though cases may go on to fatal issue without jaundice. In other cases the jaundice is not seen until after death, the patient then quickly turning yellow. Hemorrhage occurs from the nose and gums in severe cases, and it is not at all uncommon from the kidneys and stomach. The urine becomes highly albuminous and tube casts and other evidences of diffuse nephritis are sometimes present.

Yellow fever is a treacherous disease, and a good share of fatal cases result from a recurrence of the fever that might have been averted but for the deceptive stage of calm which is mistaken for convalescence. It is peculiarly a disease of double paroxysms in a large proportion of cases occurring during severe epidemics. Death rarely results in the first stage, although fatal convulsions are occasionally seen in children. The second stage is not especially fatal, but the death rate during the third stage is large, especially in cases in which suppression of the urine occurs, or that are characterized by black vomit. The vomiting is not of itself dangerous nor especially exhausting, but the disintegrated condition of the blood which results in exudation of blood-corpuscles to the stomach is responsible for the fatal issue. Uremic poisoning is also a cause of death in yellow fever, though more often seen in adults, especially those who have been addicted to the use of liquors. As may be inferred, children of dyspeptic habit are more likely to suffer from gastric complications, while those whose kidneys have been affected by the acute exanthemata are more prone to suppression of urine.

The third stage is not always fatal. In the ordinary course of the disease the patient passes from the second stage to a third stage of moderate severity. The headache grows worse, the temperature rises to 103° or 104° , the patient suffers more or less nausea, and mild delirium may occur, and yet within a day or two the patient may pass on into convalescence, either by a gradual decline of all the symptoms or by rather sudden crisis.

Convulsions rarely occur in children in the third stage, except with suppression of the urine, but in the first stage are not infrequently seen because of the severity of the fever.

In many cases yellow fever is characterized by a peculiar mental indifference dependent upon early churning of the blood with carbonic acid gas, from hepatic congestion and non-elimination of systemic debris, this indifference being a particularly fortunate symptom when the disease is occurring epidemically. For very much of the horror that would otherwise attend upon this disease, because of the swiftness of its oncoming and course, and because of its vicious epidemicity, is obviated by the unconcern of its subjects.

Diagnosis.—The diagnosis of yellow fever is by no means easy, except when the disease is prevailing actively as an epidemic. In many respects it is very much like malarial remittent fever, especially those cases that are freed of jaundice. Even when jaundice occurs in the course of its manifestations it may still be confused with the ordinary case of bilious intermittent fever in which engorgement of the liver results in the tingeing of the skin. When the jaundice is severe, and especially when black vomit has occurred, there is little likelihood of confusing yellow fever with any other disease, unless, perchance, these symptoms present in pernicious intermittent fever or in epidemics of dengue fever, in which the type of disease is not yet clearly understood. Yellow fever will be differentiated from dengue fever by the mortality that attends the former and the almost absolute absence of mortality in dengue. Black vomit is not seen in dengue except in the subjects of alcoholism, or when occurring in children of hemorrhagic habit. Pernicious intermittent fever may be confounded with yellow fever, but the former never prevails epidemically and is often seen in sections of country to which yellow fever is a stranger. Albuminuria is almost invariably present in yellow fever, though it is also seen in pernicious intermittent and even in mild remittent fevers. Yellow fever requires the introduction of its specific germ into countries to which it is not indigenous, and the presence in port of a ship from an infected locality should be duly weighed in considering the diagnosis of a supposed case of *la maladie du diable*.

Prognosis.—Yellow fever has long been accounted among the most fatal of the epidemic diseases. Its mortality under old school treatment in various epidemics has ranged, according to Osler, from 15 to 35 per cent. In New Orleans in 1878 the mortality in the hospitals was over 50 per cent. among white patients, while more than 20 per cent. of colored patients died. In private practice it was estimated that but 16 per cent. of mortality occurred. In Memphis the Secretary of the Memphis Health Board placed the mortality during the same epidemic as 30 per cent. of all cases. In Chattanooga the old school lost eighty-one cases out of one hundred and fifty-eight, giving a mortality of 51.2 per cent. The mortality in the old school hospital

at Louisville the same year was 31.1 per cent. On the other hand, the records of homoeopathic physicians reporting to the Homoeopathic Yellow Fever Commission show attendance upon nineteen hundred and fifty-one cases with a loss of one hundred and twenty, giving a mortality of but 6.2 per cent. The number of children under fifteen years of age that were treated homoeopathically was eight hundred and seventeen, of whom thirty died, giving a mortality of 3.6 per cent. There were sixty-four recoveries after black vomit had occurred, most of which cases were seen in adults.

The prognosis is more unfavorable the higher the temperature rises during the first day or two of the disease. Black vomit, while not invariably a fatal symptom, is nearly always an evidence of disintegration of the blood, and augurs ill. Suppression of the urine, followed by delirium, coma and convulsions, is almost invariably fatal, although occasionally cases recover in which the urine has been suppressed for a day or two.

Prophylaxis.—The very best treatment of yellow fever is prevention. The disease is not native to the United States and should never be allowed to gain a foothold in this country. During prevalence of epidemics in South American and Mexican ports no ship should be allowed to enter a port in this country until it has been carefully examined by a competent quarantine officer and found to be absolutely free from yellow fever; nor should a vessel be allowed to sail from an infected port for a country in which yellow fever has been known to prevail epidemically when once introduced until it has an absolutely clean bill of health. Exclusion of the exotic germ at the sailing port is the first safeguard, and disinfection at the port of destination is the next important step in the prevention of the disease. If the fever break out on shipboard there should be a period of detention at quarantine stations, and thorough disinfection of the sick and of everything that may have become infected through them. When once introduced in a community, thorough personal disinfection of all yellow fever patients is absolutely demanded. The very best of sanitary measures should be at once instituted in an attacked community and as far as possible all susceptible subjects should be promptly removed to districts in which yellow fever has never been known to prevail. Depopulation of cities and towns in which the disease gains a foothold is the best and safest prophylactic measure that can be adopted.

Personal prophylaxis during the prevalence of an epidemic implies temperate habits, regular hours, moderation in exercise, avoidance of stimulants, undue exposure to the sun and especially undue exposure to the night air. In children it is desirable that their diet should be light yet nourishing, and that the digestive tract should be freed from the annoyance arising from the eating of sweets and from the gormandizing that is common to child-life.

Especially should exhaustive exercise be avoided and perfect regularity of sleeping hours be enjoyed. It is also desirable, if it be necessary for children and young subjects to remain in an infected locality, that they should occupy upstairs rooms. The spread of yellow fever in filthy quarters and among foul tenement houses is gradual so that its increased area of infection can be mapped out from day to day. Hence it is possible, as a new section of the town is encroached upon, to remove children and other susceptible subjects from its path, but where this is not possible or not practicable the most rigid personal regimen must be adopted. Cremation of infected material and dead bodies should be practiced as securing most certain destruction of the poison, whose existence is a constant menace to susceptible subjects.

Treatment.—Besides direct medication it is very necessary in an epidemic of yellow fever that a certain defined course of action be followed in the treatment of every case if the best results are to be obtained.

Nursing.—Upon the first indication of the disease the patient should be put to bed and kept in the recumbent position until fully convalescent; in no disease is this more necessary than in yellow fever. The ventilation of the sick-room should be perfect, and under no circumstances should a yellow fever subject be housed in close, stuffy quarters, but, preferably, in an upstairs room with the breeze from such direction as insures the purest atmosphere. Yellow fever patients are not likely to contract cold, the more especially as the disease prevails during hot seasons and in Southern countries, where it is possible to have the doors and windows open for thorough ventilation. The necessity of the dorsal decubitus is especially paramount as convalescence approaches. Many yellow fever subjects pass through the first stage fairly satisfactorily only to relapse and die suddenly because of sudden change to the upright posture or too early attempts at exercise.

Nursing is more than half the battle in this disease. The patient should be made as comfortable as possible, the bowels kept reasonably open by enemata, and the skin moist by moderate bathing and the free administration of pure, cool water. In domestic practice in the South it is quite the rule to give orange-leaf tea in abundance with the idea of promoting diaphoresis and keeping up the action of the kidneys. It is no more necessary, however, to saturate the patient with orange-leaf tea or other drink for this purpose than it is to administer copious draughts of hot lemonade in measles with the idea of encouraging the eruption. Tepid sponge-baths and the free administration of cool water are grateful to the patient and should never be denied. Cool cloths to the head, should headache be intense, and when convulsions threaten, are permissible, but the ice cap or ice coil is not gen-

crally desirable, especially in children. If convulsions come on early from the intensity of fever the cold pack is allowable and often serves an excellent purpose.

Copious colon flushing, where it does not meet with resistance, is an *adjuvant* of value in children. It not only serves to keep the bowels clear and excite peristaltic action, thereby encouraging the passage of the digestive juices and the contents of the stomach downward, but by absorption the blood is supplied with liquid and the intensity of the thirst is modified. Colon douching is also an excellent method of inducing free diaphoresis. The yellow fever patient emits a peculiar, sickening odor, and should not be weighted down heavily with bed clothing nor should his room be kept close for this reason, if for no other. A single thickness of blanket with a sheet next the patient will be all the bedding required in the summer season. If the epidemic extends over into the fall and the nights are cool it will be desirable to keep the room warm through the night by a little fire, rather than weight the patient with too much bed-clothing.

In short, the secret of successful nursing in yellow fever is to make the patient just as comfortable as possible, with no fussiness, drugging or undue attention. As convalescence comes on the secret of success lies in entertaining the little patient in order to secure quiet of mind and body, in so far as possible. Restlessness and fretfulness are prone to excite relapses, and even too active efforts at bed games may result in bringing on the third stage of yellow fever with its dangerous prostration and collapse.

Diet.—This should be light and nutritious. In children it should consist chiefly of milk and weak broths or liquid nourishment made from Mellin's Food, Imperial Gramma, malted milk and similar preparations. The juice of oranges is allowable and a moderate quantity of scraped apple is permissible in special cases. But it should be borne in mind that the stomach is exceedingly sensitive in yellow fever and not capable of performing the digestive act to full perfection, hence the nourishment should be very light. In severe cases and especially when nausea is pronounced total abstinence from food should be practiced for a period of a day or two if necessary. Sips of hot water are often grateful and assist in allaying thirst and nausea when cold drinks and bits of ice but increase it, though chips of ice need not always be denied if the fever is high and the patient intensely hot, thirsty and restless; still as a rule hot water or plain cool water will be better than ice or iced drinks.

Medication.—Homeopathy has made a great name for itself throughout the Southern portion of the United States because of its success in combating yellow fever. The records of 1878 that were compiled from the reports of the various city and state boards throughout the South show the loss under homeopathic practice

to be but one-third of the loss that occurred under old school treatment. In this epidemic allopathy was wholly at sea. Some of her physicians recommended the *Quinine* treatment, others *Cabaret*, others orange-leaf tea, another class just the opposite; hot baths and copious diaphoresis by jabotandi and pilocarpine were given by some, while still others practiced the most active cathartic treatment with castor oil, epsom salts, and like agents. Meanwhile it was shown by reports of homeopathic physicians throughout the South to the Yellow Fever Commission appointed by the American Institute of Homeopathy that the unerring guide of similia was being followed in almost every section of territory so liberally that homeopathic treatment almost amounted to routineism.

In the initial stage, or stage of invasion, *Aconite*, *Belladonna*, *Gelsemium* and *Veratrum viride* will most often be used. In the second stage *Gelsemium*, *Bryonia*, *Arsenicum*, *China*, *Sulphur*, and perhaps one or two other remedies, will be required, while in the stage of black vomit, suppression of urine and collapse remedies will be demanded according to the type the case assumes. In the gastric variety, where nausea is a pronounced feature, *Ipecac*, *Antimonium crudum*, *Arsenicum*, and *Carbo vegetabilis* most meet the indications. When black vomit occurs *Carbo vegetabilis*, *Lachesis*, *Crotalus*, *Naja*, *Sulphuric acid* and *Nitric acid* will be demanded. For hemorrhagic types, *Secale*, *Millefolium* and other anti-hemorrhagics will be found useful. In the stage of collapse *Arsenicum*, *Veratrum album*, *Carbo vegetabilis* and *Sulphur* will be found most useful.

Aconite.—While yellow fever is not of the type that is ordinarily supposed to demand *Aconite*, yet this remedy is often found by clinical experience to be among the most useful in the stage of invasion, when the fever is ushered in by a sharply defined chill, quickly followed by high fever and the characteristic *Aconite* restlessness, thirst, hot skin, apprehension, and full, sharp, dirotic pulse. In children it is especially useful, and often serves to allay the high grade of nervous irritation that accompanies the first stage. It will not be required more than a few hours.

Belladonna is more often called for in yellow fever in children than in adults; but it is suited to the congestive type, no matter what the age of the patient. The eyes are intensely injected, the face florid, even purplish in hue, headache is severe, throbbing, beating and bursting in character, extending from the forehead to the nape of the neck. Convulsions threaten, or come on early; the extremities are cold, the face and trunk hot, and intensely red or cyanotic. It has been quite the habit to alternate *Aconite* and *Belladonna* in the first stage of yellow fever in young subjects, but they are applicable to different classes of symptoms and it will be better to administer them singly, as required.

Gelsemium is especially called for in cases in which symptoms partake somewhat of the character of malarial remittent fever, and where the germs of the epidemic is indicated by the prevalence of bilious remittent fever at the time when yellow fever is introduced. The pulse is full and bounding, the patient more or less stupor, with pain in the back of the head and neck, the temperature but moderately elevated, and dullness rather than restlessness characterizing the case. There is not the thirst, the intense heat and the apprehensive anxiety of *Asiatic*, nor the activity of congestive symptoms of *Belladonna*.

Eucalyptus has been given for yellow fever in swampy districts, but not with that degree of success that would naturally be expected to attend the use of it. Its symptoms are very much like those of *Gelsemium*.

Bryonia is sometimes called for in yellow fever when the case threatens to assume a low grade or typhoid character. The patient is constipated, the skin husky in hue, the eyes suffused; there are pains about the limbs and joints with intense headache and the characteristic *Bryonia* headache. The tongue is brown and furred and moderate nausea is an early symptom.

Veratrum viride is sometimes demanded in the first stage or as the case passes into the second stage with symptoms of passive congestion of the brain, full bounding pulse, besotted expression of the countenance, mild delirium and congestion of the lungs and chest.

Rhus tox.—Like *Bryonia*, *Rhus tox* may be needed in cases assuming a low grade. There is meteoric distension of the bowels, gurgling in the right iliac region under pressure, petechia of the abdomen and chest and the characteristic *Rhus* tongue and *Rhus* restlessness. *Rhus* is also useful in cases that are characterized by intense aching of the muscular system, especially of the limbs and back.

KEYNOTES.—Besides the remedies that have been named, *Dulcamara* may be occasionally useful for intense aching and catarrhal coryza, as witnessed in the first stage when the patient has taken cold during perspiration, sometimes the case in epidemics extending into the fall season. *Cicuta* and *Cuprum* may be required for their typical convulsions in children. *Ipecac*, *Antimonial trochiscs*, and *Carbo vegetabilis* may be needed to allay the nausea that occurs in the course of this disease, and if it is severe *Cuculus*, *Tadacum* and *Apomorphia* may be occasionally required. For "black vomit" *Sulphuric acid*, *Carbo vegetabilis*, *Lobelia*, *Crotalus*, *Naja* and *Secale cornutum* will have to be considered. *Sulphuric acid* will best meet those cases that are characterized by hemorrhagic effusion into the stomach, the vomit being intensely sour or acid, with decomposed blood and gastric debris. *Carbo vegetabilis* follows later, when collapse is more imminent; and

Lachesis, *Crotalus* and *Naja* best suit the severe blood disorganizations and purpuric types of the disease. *Veratrum album* and *Arsenicum* will be needed in the quick collapse that is occasionally seen in the course of yellow fever. *Arsenicum* is especially to be thought of where vomiting is severe and the prostration profound, while *Veratrum album* will be called for in cases that assume more of the choleric type. *Nitric acid* and *Secale* are occasionally called for in hemorrhagic states, and *Opium* may be needed for the profound coma which sometimes supervenes upon states of excitement or which comes on without warning in association with the suppression of the urine. *Terebinthina*, *Cantharis*, *Apo*, *Cannabis* and *Digitalis* may be demanded for suppression of the urine with threatened uremia, and it may be desirable to apply large flaxseed poultices over the region of the kidneys and to dilute the urine and overcome renal engorgement by copious drafts of orange-leaf tea or watermelon-seed tea, although, as a rule, it is not desirable to tax the kidneys with excessive activity.

For the convulsions that are sometimes seen in yellow fever in children, besides the remedies already suggested in this connection, *Stramonium*, *Monotropa*, *Opium*, *Nuxvomica* and *Belladonna* deserve study.

While a rather extensive list of remedies has been given in the treatment of yellow fever, it is not often necessary to go beyond a few of the better known polychrests in each of the respective stages of the disease. Occasional variations in course will require individual remedies, as named, but most epidemics, whether of yellow fever or of other disease, have clearly defined genuses and if these are learned early in the course of the epidemic there will not be need of great deviation therefrom.

CHAPTER XXIX.

EPIDEMIC INFLUENZA.

General Considerations—Symptoms and Course—Treatment.

General Considerations.—While la grippe or Russian influenza is by no means limited to child-life, yet, not only during its prevalence but at other times as well infants and young children suffer from attacks of a form of epidemic influenza that prevails quite extensively in the winter. It is not likely that the etiological factor of the two diseases is identical, but their clinical manifestations are so nearly alike that it is probable they arise from similar cause. Genuine la grippe is clearly shown to fol-

low along lines of travel and to spread rapidly when once introduced into a community, rising and falling with a wave of intensity such as generally characterizes the history of epidemics. The ordinary catarrhal influenza of child-life is very like the Russian variety in its manifestations but milder, and while it is not shown that it is contagious from infant to infant yet its exciting causes are so widespread during winter seasons that it is rather rare to meet with it sporadically.

Symptoms and Course.—Catarrhal influenza presents as an inflammatory condition of the respiratory mucous membrane. In catarrhal cases it develops as an acute cold, with suffusion of the eyes, roughness of the voice, sneezing and coughing. In other cases the constitutional symptoms are more severe, catarrhal symptoms marking them later. There will be slight chilliness, or repeated shiverings, and more often the child will suffer a day or two with fever, lassitude, headache, languor and manifest disturbance of the general health, cough following upon the initial symptoms, the nasal and pharyngeal membranes becoming affected later. Bronchitis and pneumonia may develop in severe cases. Sore throat and catarrh and disturbance of the bowels are not uncommon. In non-resistant children prostration will be well marked. The pulse is very rapid and irritable, and the skin is pungently hot except in those cases characterized by relaxation, when it may be hot and moist. The cough is teasing and paroxysmal. It is sometimes mistaken for the first stage of whooping-cough. The child gags and vomits as the secretion from the bronchial tubes is set up; rales are heard in the throat and chest, and in acute inflammatory types the pain of breathing and coughing prompts the child to resist these efforts as much as possible. In some instances the chest involvement is more characteristic and inflammatory bronchial pneumonia follows, especially if the catarrhal stage is very acute, the tendency being towards high fever, the membranes remaining dry. Great irritability and nervousness, with headache and symptoms of convulsions, attend in children of nervous temperament, while in other cases the fever continues for some days taking on the lower type and there will be hebetude and mental dullness. In violently acute attacks congestion of the brain may follow upon the first stage, and if in addition to the influenza the child be teething convulsions are not infrequent.

Generally the catarrhal influenza of child-life is not at all a serious disorder. If very pronounced the child will be quite sick for a few days. Fatal issues ensue only when pneumonia or congestion of the brain occurs. There is a greater degree of prostration than belongs to simple cold in the head and the catarrhal colds of changeable weather. Furthermore, acute influenza is a specific ailment occurring almost invariably epidemically. Kindergartens and primary schools are often almost depopulated when it

prevails, and when once introduced into a school or community its spread is rapid. Convalescence is usually prompt; delicate children may, however, drag along a week or two before the symptoms entirely subside.

In addition to the catarrhal state and the cough and fever older children will suffer pain in their limbs and joints and the muscular system will be sore, the muscles feeling as if they had been bruised.

The prognosis is always favorable, as stated, excepting when pneumonia supervenes or when the attack is so violent as to result in cerebral congestion and convulsions. In poor children, who are ill-nourished and not properly housed and clad, pneumonia frequently develops and is among the more fatal diseases in connection with epidemics of influenza.

Treatment.—The treatment of influenza is simple. In the catarrhal stage it is not often necessary to go beyond *Aconite*, *Belladonna*, *Dulcamara*, and *Gelsemium*. *Allium cepa* and *Artemisia* are also sometimes called for in the first stage.

Aconite will naturally be indicated if the inflammatory symptoms are very pronounced, the case being ushered in by fever, hot, dry skin, restlessness, tossing, thirst, fretfulness and dry, irritating cough.

Belladonna suits cases in which the brain symptoms are pronounced; sudden startings, dilated pupils, hot, flushed face, skin and neck moist, jerkings, twitchings and threatened convulsions make the *Belladonna* picture.

Gelsemium is called for when the fever is less acute than in the *Aconite* case. The child is drowsy with tendency to stupor; skin is hot and moist; pulse is full, yet compressible; the fever is higher in the evening and in the early part of the night; the child is not as restless as with *Aconite*; the cough is hard and painful. The *Gelsemium* child is not thirsty with the fever, and is more disposed to lie quiet than the case calling for either *Aconite* or *Belladonna*.

Artemisia is often the remedy for acute influenza, especially when it occurs epidemically. Prostration characterizes it from the onset. The child is relaxed and debilitated and looks as though it might have been sick for a week. Instead of cough there is soreness of the throat and sense of constriction and heaviness of the chest. The child clutches at its throat and chest as though it could not get enough breath.

Allium cepa has profuse catarrhal coryza; the nose runs freely and the discharge is excoriating; the eyes suffuse with tears; the child sneezes and has an irritating cough; the face is swollen and looks generally inflamed.

Dulcamara is one of the best remedies in acute influenza. It is very like *Aconite*, but the heat and restlessness are not so in-

tense. The eyes are suffused, the throat is sore, and the cough harsh because of the muscular soreness. The prompt administration of *Dulcamara* will often cut short an attack of influenza.

Besides these remedies others that may be useful in the course of this disease are *Bryonia*, especially if pneumonic symptoms develop; *Stibium*, if catarrhal bronchitis presents as a complication, with much rattling of the mucus in the chest; *Phosphorus*, if pneumonia, with its attendant symptoms and dangers, complicate the case; *Mercurius*, should there be relaxation of the bowels, with cough attended by much rattling, the cold being carried off, as it were, through the bowels; *Ferrum phosphoricum* stands immediately between *Aconite* and *Gelsemium* and is very useful in the milder cases of influenza in young children, not characterized by the intensity of *Aconite* nor the profounder fever of *Gelsemium*. *Drosera*, or *Sanguinaria* may be called for to meet paroxysmal or unusual hard and dry coughing spells, and *Kali bichromicum*, *Spongia*, or *Hepar* may be needed if the cough takes on the laryngeal character and becomes very hoarse and croupy.

SECTION IV.

DISEASES OF THE BRAIN AND NERVOUS SYSTEM.

CHAPTER XXX.

HEADACHE.

General Considerations—Nervous Headache—Rheumatic Headache—Tubercular Headache—Brain Tumors—Prophylaxis—Medication

General Considerations.—Children are subject to various types of headache, in some so severe as to be almost a blight to their sunny lives. In earliest infancy it is difficult to diagnose headache, but irritability, peevishness, and crying without ostensible cause, should suggest its possibility to the physician, especially if the child be given to frowning. Frontal headache is attended, moreover, by heat of the forehead, and a more or less languid expression of the eyes.

Headache is often seen in young subjects in association with gastric disturbances, especially in children given to the eating of candies and other sweet-meats, and from indulgence in rich pastries and fat foods. It is common also to the irregularity of meal hours belonging to child-life. Children require food in less quantity and oftener than do adults, yet they are usually subjected to the same three hearty meals per day, and if restricted to the family habit are apt to overload their stomachs, with resulting headache. The equally faulty habit of allowing children to eat at indiscriminate hours between meals is another cause of headache; for too often the between-meal luncheons of children is made up of candies and pastries.

Headaches are common in children attending school, from the close, foul air of the school room, the admission of light in wrong directions, the straining of the eyes in closely fixing the attention upon books, and from ocular defects that are not observable until school-life is begun. Headache is also caused in school children by faulty positions at their desks, and by the nervous hurry with which they eat their meals in order to avoid being tardy. The more active and nervous the temperament of the child the more certainly will there be headache from these causes.

Headache is caused, also, by faulty habits relating to the bowels and bladder. So intent do children become in their studies and games that they neglect themselves in these directions, with ensuing reflex headache.

Neurotic headache.—This is a type of suffering seen in children of ten or twelve years of age whose bowels are regular, who are not subjects of dyspepsia, who are not subjects of any organic disease to account for the headache, and who are not given to over-close application to study. Without appreciable cause a headache comes on that is made worse by noise or exertion, that is sometimes attended by vertigo and giddiness, but at other times develops into an acute sick-headache. The bowels may be torpid yet not severely constipated. The tongue is usually clean, the child is well nourished, enjoys its games, yet suffers from headache once or twice a week, or once in two or three weeks, without ascertainable cause. Such cases are obstinate and resist treatment, necessitating complete change in the plays and habits of life, and the exhibition of deep-acting constitutional remedies, the condition being doubtless due to heredity. I have met with many such cases in young subjects in whom violent headache follows upon every attendance upon church, theatre or other place of entertainment or amusement. It is often not possible for the subjects of neurotic headache to engage in the pleasures or games of child-life because of the certainty of an attack of severe headache therefrom. These headaches have been classed as hysterical, but they are not so necessarily. I have seen them in young girls of vigorous habit and strong, steady nervous system, and not at all disposed to hysteria. The operating cause is not clear. They may be due to the development of the cerebral functions in excess of the physical strength in some cases, while in others they are doubtless due to too early and active exercise of the brain function.

Rheumatic headache.—Rheumatic headache is seen in children, especially in children in whom rheumatism has followed upon acute exanthematous fevers. Rheumatic headaches are worse with changes of weather and as night comes on. They are generally superficial, the muscles of the neck and scalp being so sensitive that the pillow seems too hard, showing their external character. But rheumatism also affects the membranes of the brain, causing the most intense congestive headaches. Fortunately, these cases are extremely rare and are usually seen in association with acute rheumatism.

Tubercular headache.—This variety precedes the development of phthisis pulmonalis or tubercular meningitis in children. It is associated with irritability, headache, loss of appetite, abnormality of pulse and temperature, and other cerebral symptoms besides headache, as strabismus, and spurring vomiting, and, occasionally, involuntary defecation and urination.

Brain Tumors.—Tumors of the brain may cause severe, long lasting, even incurable headache. The headache is almost continuous when due to brain lesions, worse upon motion, and severe gastric derangement. Ocular types are also observed. The most frequent of the brain lesions to cause headache are syphilitic gummata.

Fortunately the headaches of child-life are largely symptomatic, usually attributable to systemic causes or to overtaxation of the brain, or to nervous excitement. They are painful while they last, oppressing the nervous system and interfering with the child's comfort and happiness, but as a rule are not in the least-wise dangerous.

Prophylaxis.—The treatment of headache in children should embrace something more than medication at the time of the illness. If the child's habits are irregular they should be regulated. Its hours for going to bed and rising should be systematically appointed. It is especially important in cases developing early in the day, or in which headache is present when the child awakens, that the condition of the sleeping apartment be inquired into. Most children are deprived of the necessary amount of fresh air in the sleeping apartment because of fear on the part of parents that they will take cold. The school-room and play-room should also be investigated, imperfect ventilation being one of the most active causes of headache in children.

The diet of child life is altogether too rich, ordinarily. It should be light, plain and nourishing. The habit of indulgent parents in buying candies and sweets for children is one of the most common causes of the illnesses of child-life. Children who are the subjects of headache from gastric derangement should be deprived of sweets and all rich and highly seasoned food, at least until their habit of headache has been fully overcome. The condition of the bowels and bladder should be inquired into, and the child's habits of play should be regulated so that if over energetic yet delicate the headache of prostration and fatigue may be avoided. Headache in school children often implies defective vision, and in no case of persistent headache should the eyes be overlooked; the proper application of glasses or the administration of remedies directed toward retinal engorgement and irritations will often clear up what appears to be ingrafted headache. In inveterate headaches the cause should be ascertained as nearly as possible, but deep seated constitutional remedies that are in accord with the constitution and temperament of the child are more often indicated in local sufferings.

Climatic change to the seashore or mountains or to the country is often beneficial in the headaches of children, and radical changes in games, habits at study and general habits of life are also required in many instances.

Medication.—Besides the administration of constitutional medicines, as indicated by the general state of the health of the patient, special remedies for headache are often productive of prompt results. *Sulphur*, *Silicia*, and *Calcarea*, either the *carbonica* or *phosphorica*, are the leading basic remedies for headache of children, while *Belladonna*, *Ipecac*, *Nux vomica*, *Ignatia*, *Gelsemium*, *Iris versicolor*, *Spigelia*, *Sanguinaria*, *Cocculus*, *Bryonia*, *Glowinina*, *Anacardium*, *Pulsatilla*, *Sepia*, and *Natrum muriaticum* are remedies that will be required in individual attacks of headache.

Belladonna is among the most commonly indicated remedies for headache in children, as for headache in adults. The pain is worse on the right side and in the frontal region, and is so aggravated upon lying down that the patient is compelled to sit up or walk around. The pain is of a stabbing, lancinating character, greatly aggravated by light, noise, and jarrings. The face is either intensely red or very pale. Congestive headache of severe type indicates this remedy, headache with dilation of the pupils, flushed face, throbbing carotids, pain coming on in paroxysms, the feet and limbs being cold, while the head and face are hot. These symptoms call for *Belladonna*, which, when indicated, gives prompt relief. *Belladonna* is also indicated in cases arising from exposure to the sun.

Iris versicolor is a remedy very often indicated in the headaches of children in association with gastric derangements; this headache comes under the classification of school headache. The pain is intense and increases up to a certain degree, when vomiting occurs. The pain is of a throbbing character, is located above the orbits and in the temples, is so severe as to cause disturbance of vision, even to temporary blindness. The symptoms are relieved when vomiting occurs, which is generally of a bitter taste. *Iris* is adapted also to the headaches of exhaustion following upon over-close application of the brain. The headaches of young school girls are often promptly relieved by it, especially where relief follows some vomiting, whether from primary derangement of the stomach or not.

Sanguinaria is a school-headache remedy of first importance. Pain, beginning in the morning in the occiput, passes up through the head settling in or about the right eye. As with *Belladonna* the patient cannot endure light or noise. The headache continues to intensify all through the day up to night, and is relieved by sleep. The pain is of a sharp, lancinating character, and when at its height the patient is compelled to lie perfectly quiet; cannot bear either sound, light, noise or odors. Headache occurs every seventh day or thereabouts. When associated with disturbance of the circulation, as coldness of the hands and feet and surface of the body, coldness of the face, nose and ears, *Sanguinaria* is called for.

Vomiting occasionally relieves the *Sanguinaria* headache, but not always.

Pulsatilla is another remedy that is applicable to headache of gastric origin. The headache is usually frontal or supra-orbital, and is worse from mental exertion and the application of warmth. The pain is erratic, wandering from one part of the head to the other, especially to the side lain upon. *Pulsatilla* is also suited to rheumatic headaches that migrate from one side of the head to the other in association with wandering rheumatism.

Nux vomica.—The headache of *Nux vomica* occurs for the most part in the morning, and is of a congestive type, or seen in association with gastric derangement from poisoning of the stomach by rich foods and highly-seasoned articles. The pain is sharp, as if a needle were being thrust into the brain, or there may be a sensation as if the skull would split. Headache every morning, worse after eating, and in the open air. The headaches of children who use coffee and who eat highly-seasoned food are often relieved by *Nux* as by no other remedy; while, on the other hand, *Pulsatilla* is more suited to stomach derangement where headache is the result of eating fat foods and greasy articles of diet.

Ignatia.—The *Ignatia* pain is as if a needle were driven into the parietal or occipital region. Pain unusually severe, but so circumscribed that its locale can be covered with the finger-tip. The patient is very nervous and hysterical: as the pain is relieved there is a free flow of pale, limpid urine.

Gelsemium is applicable to headache that commences in the nape of the neck and passes over the head, settling in the eye (*Sanguinaria*). It is worse in the morning, and consists of a dull heavy ache, with heavy eye-lids and general languor. As the headache of this remedy is relieved the *Ignatia* urine symptom is observed; but the difference in the character of the pain, and the difference in the nervous condition of the patient will determine the change. The *Ignatia* patient is exalted, sensitive, excessively nervous. The *Gelsemium* patient is rendered weak, relaxed, and debilitated by the pain.

Spigelia.—The *Spigelia* headache comes on in the morning, increases steadily up to night and declines in the afternoon, passing off at nightfall. The pains are neuralgic in character, and settle over the left eye or behind it; the pain becomes boring in character as if something were boring through the eye, behind or below it. When this symptom is present the headache is really agonizing.

Melilotus is adapted to nervous and sick headache of the congestive types with a sensation as though the brain would burst through the forehead. The face is highly congested, livid. The pain is so severe as to drive the patient almost frantic. The *Melilotus* headache is often attended by nose-bleed, which relieves it.

Natrum muriaticum is especially applicable to the headache of school children; head aches severely as if it would burst, accompanied by sharp stitches about the head and oppressed feelings about the eyeballs, worse when the eyes are moved. *Natrum muriaticum* is especially suited to headaches that come on every morning and increase in severity about 10 or 11 o'clock.

Ipecacuanha is another remedy that is often beneficial; it is attended by deadly nausea, pale face, blue lines under the eyes; patient unable to move without nausea and vomiting.

Cocculus has headache in the occipital region, in the lower part of the head, back of the head and nape of the neck. Nervous and gastric headache with seasickness, or nausea in association with vertigo. The patient is unable to lie on his back because of pain in the back of the head and neck; is compelled to turn to one side. *Cocculus* is to be thought of when the child closes its fingers over the back of the neck, holding the nape firmly because of the pain.

Calcarea carbonica is a gastric remedy that will often be found beneficial in a typical *Calcarea* child who is suffering from headache, especially when there is icy coldness of the head with coldness and clamminess of the extremities. The pain is so violent on the top of the head that the patient thinks he will go crazy. Severe headache and debility in young girls suffering from profuse menstruation calls for *Calcarea*.

Calcarea phosphorica.—The headache of school boys and girls continuing steadily, occasionally increased to violent attacks. *Calcarea phosphorica* has been proven clinically to be one of the first remedies arising from brain-tire in delicate children who are pressed at school or who apply themselves too closely to their books, especially children who are growing rapidly and whose mental development is out of proportion to their physical strength.

Phosphorus.—*Phosphorus* is indicated when there is a cold, cramping pain on the left side of the head, with a sensation of coldness in the base of the brain, with general prostration and nervous debility. While not often called for in headaches yet *Phosphorus*, when indicated, gives quick relief from the nervous debility and general nervous prostration that is associated with headache attended by this sense of coldness in the base of the brain.

Phosphoric acid rivals *Calcarea* and *Natrum muriaticum* for the headache of school children. It is indicated in headache from occiput forward that is relieved by lying down and that is followed by a moderate flow of urine of foul odor. (*Iguatia* and *Gelsemium* are applicable for clear, limpid urine.)

Anacardium is another remedy that is especially beneficial in headache from mental overwork and fatigue. It has tearing pains in the forehead and back part of the forehead. Headache occurring from a misstep and aggravated by loud noise and strong colors. Patient unable to think. Persistent headache seems to

almost paralyze the mental faculties, so that the patient is dull and stupid and indifferent.

Picric acid is still another remedy that is beneficial for headache from overwork and excitement. The headaches of school children who study too closely, and headache following upon the intensity of excitement arising from emotional dramas and similar excitements are often promptly relieved by this remedy. The pain is essentially in the forehead and eyeballs, backward over the head and occiput. It is relieved by lying down and keeping quiet.

Bryonia.—The pains of *Bryonia* begin in the occiput or in the forehead. The headache is of a splitting character extending backward to the occiput, or beginning in the occiput, extending down the neck, shoulders and back. The *Bryonia* headache is intensely aggravated by motion and is of a jerking and shooting character, shifting to the side him upon, and if associated with gastric disturbances is relieved by vomiting.

Magnesia phosphorica is applicable to neuralgic headache with sharp, jerking, intermittent pains that are relieved by warmth or pressure. *Magnesia muricata* is applicable to hysterical and congestive headaches which are relieved by prompt pressure.

A few special remedies that have key note symptoms worthy of remembrance in the headaches of children are given in this connection.

Occipital headaches suggest *Sanguinaria*, *Gelsemium*, *Bryonia* and *Nux vomica*. Headache as if from a nail driven in the brain calls for *Ignatia*, *Thuja*, *Coffea*, and *Hepar*. The *Hepar* pain is as if the nail is being driven into the right side of the head. *Ignatia's* pain is as if a nail were driven into the parietal or occipital region. *Thuja* and *Coffea* have sensation as though the nail were driven into the occiput, and *Thuja* also as having a nail driven into the frontal eminence. Sick headaches call for *Iris*, *Sanguinaria*, *Nux vomica*, *Pulsatilla*, *Ipecacuanha*, *Bryonia* and *Cocculus*. Nervous headaches require *Nux vomica*, *Ignatia*, *Chamomilla*, *Moschus*, *Phosphorus*, *Calcarea*, *Cocculus*, *Antimonium carbonicum* and *Anacardium*.

Headache as if with band around the head calls for *Gelsemium*, *Iodine*, *Carbolic acid*, *Mercurius* and *Sulphur*.

The *Magnesia phosphorica* headache is relieved by warmth.

The *Pulsatilla* headache is aggravated by warmth.

Spigelia has a sensation as though the head were bound around the vertex.

Piris quadrifolia has headache of spinal origin, and sensation as if head were immense.

Natrum muraticum has headache as though hammers were pounding within the head.

Silica has nervous headache caused by excessive study at school. It is worse over the right eye.

Argentum nitricum has headache relieved by pressure.

Silicia's headache is relieved by the application of heat.

Glowinnia has very severe throbbing headache as if the blood vessels would burst.

Phellandrium has pain as though a weight were on the top of the head.

Kali bichromicum has temporary loss of sight, with severe headache, worse on the right side. Headache increases as sight is regained.

Cannabis indica has sensation as if head were opening and shutting along the vertex.

Arnica is especially adapted to headaches occurring from concussion from falls or blows upon the head.

Argentum nitricum, like *Puris quadrifolia*, has sensation as if the head were extremely large.

China is especially useful in the headaches of anemic children.

CHAPTER XXXI.

CONVULSIONS.

General Considerations—Rickets—Indigestion—Worms—Symptomatology—Diagnosis—Prognosis—Treatment—Adjuncts—Medication.

General Considerations.—Convulsions occur in children from many causes. They are often seen in connection with the teething process, and have long been considered directly due to the nerve irritation and nerve exhaustion incident to the cutting of the teeth. The greatest mortality occurs during the first half-year of life. Up to this time but very few children have cut any considerable number of teeth, perhaps none at all, or at most the lower incisors; but it must be borne in mind that the teeth are erupting in the maxilla, and that a certain degree of irritation is being experienced as the tooth is pushing itself up through the gum and gum-membrane. Furthermore, there is a changed relationship of the proximate principles as they bear upon the nervous system in the upbuilding of the tooth, and thus convulsions are often resultant upon this process, independent of the presentation of the teeth against the gum-membrane.

Rickets is a common predisposing cause of convulsions, though it is not understood just why convulsions result more often in rickety children. It is probably because the nervous system is badly nourished—just as the balance of the system is below par—and is more unstable and susceptible to reflex impressions in rickety children. Teething is a normal physiological process, and

should not so disturb the nervous system as to induce spasms. Nor is it believed to be responsible for convulsions in healthy children; but if the nerve centres are not thoroughly well-nourished, they are easily shocked by reflex irritations, and it is easy to understand how the nervous wear and tear belonging to the teething process may so unsettle the nervous equilibrium that spasms will result.

Indigestion is a frequent cause of convulsions in young children. Here the stomach, if overloaded with indigestible food, is the site of the irritation. It is possible that convulsions arising from this cause are due to toxæmia from the absorption of poisonous ptomaines; but it is far more likely that the condition is purely a reflex one. This thought is supported by the clinical fact that convulsions arising from indigestion are easily overcome by the forced emptying of the stomach and bowels by emesis and enemata.

Worms, adherent prepuces, hooding of the clitoris, with accumulation of smegma, inflammatory irritations of the ostium vaginae, and like irritations result in spasms. Fever is also a common cause of convulsions, some children going into spasms upon the simplest manifestations of febrile excitement; and in severe fevers, as typhoid, scarlatina, diphtheria, small pox, and other blood-poisoning states convulsions are frequently observed, doubtless due to toxæmia and nervous irritation from continued heat of the blood and nerve centres. Congestion of the brain from a blow or fall, or from violent explosive paroxysms of whooping-cough, sometimes results in convulsions, and the sudden suppression of acute diarrhea is also a common cause of spasms in the early years of child-life. Certain cerebral diseases, as meningitis, either the simple or the tubercular variety, tumors of the brain, and infantile syphilis, in association with cerebral sclerosis, are usually attended by convulsions. Besides all these causes anger and other mental perturbations sometimes result in a degree of hyperæmia that is followed by convulsions. Severe constipation has been known to cause convulsions; in fact, almost any disturbance of health in child-life in susceptible subjects may result in sufficient shock of the nervous system to occasion more or less violent attacks of convulsions.

Not infrequently it is impossible to ascertain their cause. A child at play, in apparently perfect health, may be seized with a violent spasm, never to have another, the cause remaining undiscovered. Repeated convulsions imply continuation of the cause, and it becomes highly important that it should be diligently sought for and removed.

Symptomatology.—Convulsions usually come on suddenly, without any warning. The child is nursing at the breast, engaged in play, or asleep, and is suddenly taken with a convulsion; or, there may be a preceding stage of restlessness accompanied by

twitchings, nervous jactitations, and grinding of the teeth. The convulsions are usually first seen about the face and eyes. The eyes roll to one side or upward, or they may simply have a far-away look. These symptoms are quickly followed by twitchings of the muscles of the mouth. In tonic convulsions the first symptoms are contractions of the fingers and toes, especially the thumbs and great toes. The initial symptoms are soon succeeded by rigidity of the arms and legs, the head is thrown backward and to one side, the body becomes stiff, and breathing is suspended temporarily by spasms of the chest muscles. It is this rigidity of the chest which increases the spasms and causes a general appearance of cyanosis by inducing passive congestion of the brain. In teething children the first symptoms of spasms are observable in the abdomen, which becomes hard and rigid, the solar plexus becoming the seat of the initial irritation. Spasms may often be averted by turning the child on its stomach over the knee, or by pressing firmly over the abdomen for some minutes with the palm of the hand when a spasm threatens. A child in spasms should always be placed in the prone position across the nurse's lap.

A typical convulsion closely resembles an epileptic seizure. If the spasm is clonic in character it is usually of briefer duration than the epileptic fit, while if tonic it is apt to be more prolonged and vigorous. In severe cases the child is shaken in violent convulsions, and in the worst form is convulsed in severe muscular movements. Spasm of the glottis may occur, giving the child an appearance of suffocation. In most cases the face is violently red and congested, but in others it is extremely pale. In association with acute disease the head is intensely hot and the temperature considerably elevated. The child is unconscious during the fit, no matter what its cause, and may remain so from a few minutes to hours at a time. There may be but one convulsion, quickly over, or spasms may be continued over a number of hours with varying intensity, the shock to the nervous system being exceedingly severe, resulting in exhaustion, paralysis, and often in death. A fatal issue may result from spasms of the glottis and suffocation, or in other cases be due to rupture of blood vessels in the brain, while in yet others it will result from idiopathic paralysis. Death rarely occurs from convulsions, except in association with organic brain disease, or with especially severe manifestations of acute exanthema or cholera infantum, where the system is already so debilitated that the child is unable to resist the terrific influence of violent convulsions in addition to the burdens it is already bearing.

Diagnosis.—Convulsions seen immediately after birth are due either to injuries of parturition or to congenital pathological disturbances. It is not often that reflex disorders have causative relation to eclampsia at this time. Children who are sufferers

from hydrocephalus at birth may be born with convulsions. But, as a rule, convulsions occurring at this period are due to brain compression. Convulsions occurring a few days after birth may be traceable to infective omphalitis. They occasionally supervene also upon carbonic acid poisoning in association with jaundice, when the ductus venosus is at fault. Convulsions coming on suddenly in children a few months old are more often due to teething and gastro-intestinal disturbances than to other causes; although meningitis may be ushered in by convulsions, or acute fevers may show eclampsia among the initial symptoms. Convulsions following upon the eruptive fevers some weeks, or months even, after the subsidence of the exanthema may be due to kidney involvement not previously recognized. All cases of convulsions occurring without traceable cause demand examination of the urine for albumin. The ordinary acute convulsions of child-life as diagnosed from epilepsy will be dealt with in the consideration of that disease.

Prognosis.—Convulsions in child life are always attended by danger, and the first seizures of early infancy are just cause for grave concern. Death may occur in a single attack, so violent may be the congestion of the brain and cord, or so great the endangering rupture of blood vessels. The earlier they occur the greater the liability of a fatal issue. Occurring within a few days or hours after birth, and implying brain or meningeal injuries, convulsions are quite likely to result fatally, though not invariably so. In association with high fever, no matter when they occur, they may be looked upon as more dangerous than if the temperature be normal. If occurring in association with acute diseases that have debilitated the system and tested the nervous abilities of the infant the prognosis is more grave than otherwise. Occurring as a symptom of indigestion, or from reflex irritation of teething or wormy conditions, they are not so ominous and may be of but passing moment. Many children are the subjects of convulsions who do not seem to suffer especial harm from them. They often occur as a symptom of other diseases and seem to have no special evil import, if not long protracted nor unusually violent. The prognosis will depend more upon the general state of the health of the child than upon the character of the convulsion; yet, as has already been hinted, if unusually long protracted they may be very dangerous, even in robust subjects. Convulsions occurring in association with typhoid fever, meningitis, pneumonia, whooping-cough and scarlet fever are always ominous. Those depending upon kidney engorgement are likely to be continued as long as the kidneys are seriously affected. The temperament of the child, the nature of the case, the character of the convulsion, its duration and tendency to repetition, must all be taken into consideration in forming the prognosis. It goes with-

out saying that convulsions are always to be averted when it is possible. Unfortunately, they are usually on before the physician is called.

Treatment.—The treatment of convulsions resolves itself into the application of adjuvants and medication.

ADJUVANTS.—In young subjects the application of cold water to the head and the immersion of the body in warm water, thus determining the blood to the surface and extremities, will often modify the severity of the spasms and shorten their duration. If due to indigestion the use of a copious enema is recommended, it being desirable to unload the alimentary tract as quickly as possible. It is not always wise to practice emesis during convulsions, lest particles of ejected food find their way to the wind-pipe and add to the gravity of the situation. If caused by acute fevers the tepid bath or the sharply cool pack will be found very beneficial. In the severe convulsions of children that are attended by intense heat it has been my practice to wrap the child in a cold pack, stripping it perfectly naked and enclosing the body and limbs from the neck down, with cooler cloths to the head, repeating the application as often as necessary, the indications for its repetition being the intensity of the heat and the continuation of the convulsion. Mustard foot-baths will answer in some cases of convulsions of young children when the complete bath is not available. If the convulsion comes on during the teething process and the gums are enormously swollen, hot, glistening and fibrous to the touch gum lancing may be practiced. I do not place much reliance upon this procedure, as a rule, but in special cases the relief that follows is so pronounced that it is justifiable when the physical condition of the gums is such as to seem to demand it. I have never known harm to follow from gum lancing, and can hardly imagine how it is possible to inflict injury upon the child by this practice if reasonable care is exercised to secure asepsis of the lancet. Children in convulsions should be kept as quiet as possible, and gently supported in order that they may do themselves no harm, but forcible resistance against the spasms is never justifiable because of the danger of injury to the delicate muscles, and because the application of force often serves to excite more violent spasms. Firm pressure over the abdomen is generally helpful in spasms of children if applied when the first symptoms show about the face and eyes, or by the clenching of the thumbs, and may be so effective as to avert the completed convulsion.

MEDICATION.—Inhalations of chloroform or ether are justifiable in severe seizures. The careful administration of anesthetics, to complete anesthesia, will often abbreviate their duration and materially modify their severity. It is usually safe to administer a few drops of chloroform or ether—preferably the former in children, because of the tendency of ether to excite an excess of bron-

chial secretion—on the handkerchief or by an Eschmarch inhaler. If the convulsion be preceded by a minute or two of premonitory symptoms it can sometimes be altogether averted by anesthesia. It will rarely be necessary to push this to surgical degree, yet in the severest cases complete anesthesia may be required.

The remedies most useful in the convulsions of children are *Belladonna*, *Nux vomica*, *Cicuta*, *Cina*, *Aethusa*, *Ignatia*, *Stramonium*, *Glonoinum*, *Caprum*, *Hymenocallis*, and, in physiological doses, *Pulsifera incarnata*.

Belladonna will be indicated when the face is bright red and intensely hot. The child becomes suddenly rigid, stiffens out, and foams at the mouth. Sudden twitchings and jerkings occur in sleep. Between convulsions the child starts and twitches or cries out suddenly; in other cases it moans incessantly. *Belladonna* is especially applicable to the convulsions of meningitis, scarlet fever and the summer complaints of young children. The appearance of the face and neck indicates congestion of the brain.

Gelsemium is more especially adaptable to convulsions associated with fever, especially malignant fevers, or fevers of a low type. There is rigidity of the back of the neck and muscles of the sides of the neck, preceded by aching and pain between the shoulders. The eyes roll from side to side; the child is restless and intensely hot, but moist. The *Belladonna* convulsion comes on suddenly, while the *Gelsemium* convulsion has longer prodrome, and the headache and spasm are more in the back of the head than with *Belladonna*.

Cina.—This remedy is especially indicated in the spasms associated with intestinal irritation, whether from worms or intestinal indigestion. The child suddenly stiffens out and goes into a convulsion, twitching the facial muscle, especially the mouth, gnitting its teeth and clinching its thumbs as the spasm comes on. The face is unusually pale, the child anemic and of wormy diathesis.

Glonoinum.—*Glonoinum* is especially indicated in convulsions that come on from heat, as the heat of the sun, the face being bright red, pulse full and sharp, heart's action violent and irregular, the patient frothing at the mouth and unconscious. Intense congestion of the brain. The convulsions of *Glonoinum* are very much like those of *Belladonna*. The latter will be especially indicated when the pupils are widely dilated and the face alternately red and pale, while *Glonoinum* is more especially indicated if the picture be that of *Belladonna* but with contracted pupils.

Ignatia is useful in spasms brought on by emotion, especially grief and suppressed anger after chastisement or other punishment for disobedience. Stiffness of the muscles and extreme rigidity of the whole muscular system. The child stiffens out in tonic spasm and is severely rigid.

Aethusa is especially useful in the convulsions attending the summer complaints of children. Spasm commences in the fingers and toes. Fingers clinched, thumbs drawn in, face red and opisthotonos pronounced. The eyes are drawn backward, the spasm presenting an epileptiform appearance.

Cicuta.—The *Cicuta* spasms consist of violent shocks of the head, arms and legs, which cause them to jerk suddenly and violently. Spasmodic rigidity of the feet. Spasms renewed from the slightest touch, jarring of the bed or slamming of the door.

Nuxvomica.—The *Nux* spasm is also renewed by the slightest touch or sudden noise or jarring of the patient. Convulsions arise from indigestion or severe exhibition of bad temper. Children suffer convulsions from indiscretions on the part of the nurse in the matter of diet. Severe attack of indigestion in the mother may be followed by convulsion in the nursing child.

Capraea.—Spasms beginning in the fingers and toes with thumbs clinched as in *Aethusa*. The latter is more especially to be thought of when the thumbs are clinched. *Capraea* has rigidity of the muscles of the jaw, causing the child to bite the spoon when efforts are made to give medicine, and is especially useful in the convulsions attendant upon recession of eruptions in the exanthema. *Capraea acutius* is to be thought of, too, in connection with retrocession of the eruption.

Stramonium is also applicable to convulsions arising from suppressed eruption. The child shrinks from everybody and is frightened. Its face is swollen and turgid; the spasms are renewed or aggravated by bright light. Room must be kept dark. Spasms continually change character. Patient not so rigid, and movements not so angular as in *Belladonna*, *Cicuta*, and *Capraea*.

Opium.—The *Opium* child wakens frightened, screaming and crying until the spasms set in, which jerk it from head to foot; eyes upturned, head thrown backward, legs and arms spread out. Screaming, shrieking, with contracted pupils during the attack.

Zincum is more likely to be useful in the spasms of teething children. The child rolls its head from side to side, has pain and cries and is irritable; its face is pale with dark circles under the eyes. Twitching of the various muscles, child jerking violently during sleep; is so debilitated that it seems not to have strength for a violent spasm. Cries out during sleep and wakens frightened.

Besides these remedies *Ipecac* may be called for in spasms the result of gastric derangement due to eating rich food. *Ieratrium* will be required if the face is cold and the forehead and face bathed in cold sweat. *Terebinthina* and *Stannum* may be needed in convulsions arising from worms, the latter from tape worms, *Terebinthina* more especially from thread worms, with vesical irritation. *Mullestro* has been proven clinically to be of value in unusually

long and severe convulsions in very nervous children, the spasms being due to dentition or to worms. *Lauracerasus* should be thought of in connection with spasms of the throat especially, causing gasping for breath and severe cyanosis. *Kali bromatum* is applicable to spasms occurring in the night in association with the nightly terrors of children; child afraid to be left alone because of convulsions. Its spasms are epileptic in character and are due to dentition or worms. *Arnica* will be required if the spasm is due to concussion of the brain or severe nerve shock from a fall or other injury. *Hypericum* and *Arnica* are useful in spasms from nerve injury and in trismus (See trismus neonatorum). *Acornite* may be demanded in spasms occurring in association with acute fear, the usual *Acornite* symptoms being present. The routine administration of *Belladonna* for convulsions often prompts its exhibition when *Acornite* is better indicated. In occasional cases, especially when seen in association with atrophy, *Sulphur* and *Phosporum* may be required in order to develop on the surface repelled or undeveloped chronic eruptions, the appearance of the eruption securing relief from convulsions and starting the child upon the road to general improvement and recovery.

Convulsions caused by impure vaccination may be relieved by *Silicia*. The spasms of St. Vitus' dance call for *Agaricus*, *Hyo-cyanus*, *Tarentula*. If the emotions of the child are uncontrollable *Atropa* will meet the spasm, which are hysterical in character. *Cicuta* will be required if the child lies motionless, as if dead, for a considerable length of time after a convulsion. Convulsions attended by wild shrieks may need *Apea*, *Cicuta*, or *Hyo-cyanus*. If the body is bent backwards and the convulsions are unusually violent *Strychna* will be called for.

CHAPTER XXXII.

MENINGITIS.

General Considerations—Acute Simple Meningitis—Symptoms and Course—Sub-Acute Meningitis—Treatment.

General Considerations.—True inflammation of the cerebral tissues, or cerebritis, is never seen independently, but inflammation of the membranes of the brain is among the common diseases of children.

The dura mater is subject to inflammation of its internal and outer layers, the latter usually succeeding to injuries or diseases of the cranial bones, more commonly to accidents, and by extension of inflammation from the middle ear through the mastoid to this

tissue. inflammation of the dura mater also accompanies various specific diseases, as erysipelas, syphilis, and tuberculosis. It is also seen in connection with the acute gastro-enteric ailments of infants. The traumatic variety is attended by severe headache, delirium, fever, and more or less unconsciousness, even to complete coma and convulsions. In children it follows upon falls or blows upon the head, and is usually so directly traceable to the accident that there should be no confusion in the diagnosis. It is possible, however, for it to set up secondarily to a fall or bump on the child's head that has not especially attracted attention at the time of its occurrence. If the internal layer of the dura mater is primarily involved the inflammatory process is the result of inflammation of the connective tissue, with hemorrhage, and is essentially of a hemorrhagic character. It is not necessary to enter into careful differential diagnosis between inflammation of the two layers of the dura mater, but it will be sufficient to treat of inflammation of both layers as of but one tissue.

The pia mater is also the site of acute inflammation and it is when this tissue is the seat of the inflammatory process that the name "brain fever" is given it. It may occur as secondary to injuries, but is most likely to follow upon acute exanthematic diseases, as typhoid fever, scarlet fever, acute inflammatory rheumatism, and small pox. It occurs sometimes as direct extension of diseases of the middle ear and from destructive processes about the orbit or cranial bones. There is no essential difference between the symptomatology of the pathological states of the dura mater and pia mater when they partake of the character of acute inflammation. To be accurate, inflammation of the dura mater is classed as *pachy-meningitis*, while that of the pia mater is denominated *cerebral lepto-meningitis*.

For clinical purposes it is sufficient to describe the various types of meningitis as *acute simple meningitis*, *cerebro-spinal meningitis*, and *chronic basilar or tubercular meningitis*.

Acute Simple Meningitis.—This form occurs most often in tubercular or rachitic children, in whom the constitutional dyscrasia is not, however, the direct cause of the inflammation. It is necessary to differentiate it from typical tubercular meningitis, in which there is inflammation of the pia mater caused by the presence of tubercles. The simple form is most common during the first two years of child-life and arises idiopathically or from injuries to the head. It is also an accompaniment or sequel to the acute exanthemata and occurs in connection with extension of otitic diseases. It is this type of meningitis that follows upon overexposure to the sun's rays, and that is the result of sudden suppression of the inflammation of erysipelas of the face and head.

SYMPTOMS AND COURSE.—Acute meningitis is ushered in by severe headache, and chill followed by fever and delirium. In

child-life vomiting is an almost constant attendant upon it. The headache is intense and the fever persistent. The vomiting is peculiarly spurring and gushing in character and occurs early in the course of inflammation, which is not usually persisting. The thermometric range is not high, 103° or 104° , but the head is hot, the pupils dilated, the conjunctivæ congested, the patient exceedingly sensitive to noise and jarring motions, the face either intensely red or very pale, and in occasional cases, if photophobia is pronounced, the pupils may be contracted. The convulsions may be epileptiform in character, or tonic. In some cases there is contortion of the neck and muscles of one or both shoulders; the face is drawn and convergent or divergent strabismus, with perhaps upturning or downturning of the eyeballs, is seen. During convulsions the pupils will certainly be contracted, while as relaxation and coma come on they will be widely dilated, and the retina is no longer sensitive to light. This disease is not uncommon during the teething process, although not directly due to this cause. The vomiting is peculiarly characteristic, and as the case progresses during the irritative stage the brain cry or sharp, piercing shriek of the meningeal infant is heard. After a period of twelve to twenty-four hours of intense cerebral excitement and violent headache, with tonic or clonic convulsions, relaxation may occur, the vomiting be less frequent and the abdomen, which has before been full and round, be perhaps collapsed; the eyes look swollen and bulged from the degree of congestion of the conjunctivæ which has taken place, and the child's mouth is dry, its tongue red or brown, its features drawn and its jaws kept in motion, as if chewing or swallowing. This chewing motion is quite characteristic of the second stage of cerebral inflammation.

Unless, under proper treatment, the symptoms be relieved within the first twenty-four or thirty-six hours the case passes on into the third stage, or that of coma and insensibility. The child no longer pays attention to anything about it, the conjunctivæ are insensible to pain and the eyes to light, the tongue is coated with a brown fur, the skin is harsh and dry, and from a full, plump infant the child will suddenly have sunken away to emaciation. Unless associated with the gastro-intestinal ailments of infancy constipation is usually present; the bowels are torpid, not moving at all or only by the use of enemata.

This variety of meningitis runs a very acute course, death from convulsions taking place in two or three days or a week, in a state of more or less complete unconsciousness and clonic rigidity. If the inflammatory process shall have extended to the brain tissue the capillaries of the meninges and gray matter will be distended and engorged with blood, acute inflammatory congestion of both brain and membranes insuring almost certain fatality. These cases are very like sunstroke in their effect upon the brain and

nervous system. The more acute the inflammatory process the more defined the delirium and convulsions. In rare cases death ensues from general paralysis, presumably from the degree of cerebral infiltration that occurs. A week or ten days covers the course of the ordinary attack of acute meningitis, but should recovery follow the patient is likely to drag along a number of weeks before convalescence is established. The disease is intensely fatal, and since it occurs in such a large proportion of cases in connection with zymotic diseases, that are in themselves about all that the infant can bear, the prognosis is invariably grave, and but little is to be hoped for in the way of satisfactory treatment.

Sub-Acute Meningitis.—The acute variety is, fortunately, not very common. Sub-acute meningitis may develop from other diseases and as a complication. When apparently doing well in the course of a pneumonia, bronchitis or an erysipelatos inflammation, cerebral symptoms, as vomiting, retraction of the abdomen, opisthotonos, and a semi-comatose condition may come on without warning. Convulsions may or may not attend upon this variety of meningitis, the child dragging along through days or weeks in a semi-unconscious condition, being able to take sufficient nourishment to keep it alive, and to partially notice what is going on about it. Occurring mostly in infancy, or in very young subjects, the symptoms and conditions take on those of the hydrocephaloid state. In individual instances sub-acute inflammation follows injury to the head, the symptoms presenting so gradually as to differentiate the condition from acute inflammation. Vomiting may occur at the time of a fall, with some fever, headache, dilation of the pupils and nervous irritability, these symptoms passing away and secondary symptoms, as strabismus, inequality in size of the pupils, optic neuritis and convulsions occurring three or four weeks, or as late as two or three months, after the injury.

Treatment.—The general treatment of acute or sub-acute meningitis occurring idiopathically, or in connection with traumatism, differs from that of the tubercular form of the disease in the fact that the remedies that are most applicable to it are those suited to acute inflammatory processes, not dependent upon constitutional dyscrasie or associated therewith. Occurring independently of injury, *Aconite*, *Ferrum phosphoricum*, *Belladonna* and *Bryonia* are especially to be thought of. If traumatism is the cause *Arnica*, *Ledum* and *Hypericum* are more likely to be suited to the case. If from intense heat *Belladonna*, *Glonoinum*, *Gelsemium* and perhaps *Veratrum viride* may be needed. If of metastatic origin, as from sudden suppression of erysipelas, or acute inflammatory rheumatism *Rhus tox.*, *Apsis*, *Belladonna*, and *Sulphur* will probably be the chief remedies.

Aconite is especially useful in the regular *Aconite* picture. The case is ushered in with a chill, quickly followed by fever.

intense thirst and general restlessness. The skin is hot and dry, head tossing and rolling, not keeping still a moment; screaming as if in pain; face flushed, eyes injected, forehead intensely hot. If these symptoms are not relieved promptly under *Acetate*, *Ferrum phosphoricum* may be found to meet the condition; especially when the temperature is not higher than 102° or 103° and when the symptoms are not present in the intensity belonging to *Acetate* will it be found useful.

Belladonna.—The face is greatly congested, the eyes blood-shot, pupils widely dilated, delirium and convulsions occurring early; opisthotonos pronounced, hands clenched, clonic convulsions; face and neck intensely red, the case characterized throughout by congestion. Patient quickly passes from one convulsion into another, and from convulsions into profound stupor, with besotted expression.

Bryonia is especially useful when the indications point to effusion; the delirium is not so violent as with *Belladonna*, the face is darker and more congested, the mouth is dry, and there is a constant chewing motion. Intestinal torpor characterizes the case, and the patient is conscious; prefers to lie perfectly quiet because of the aggravation of the headache from motion, which is also increased from light and noise.

Glossinum.—The congestion of *Glossinum* is most likely to result from sun-stroke or heat-stroke. The face is intensely red or directly the opposite, very pale; the pupils may be widely dilated or closely contracted. Convulsions occur early and are usually severe; incontinence of urine; opisthotonos. The head is intensely hot in the *Glossinum* case, and the convulsions are violent and persistently tonic, rather than clonic in variety.

Gelsemium, *Veratrum viride*, *Solanum* and *Casta* may have their uses in connection with the convulsions and unconsciousness of acute meningitis, according to their individual indications.

Gelsemium especially has been found useful in the meningeal complications arising during the course of the gastro-intestinal diseases of children. Initial convulsive symptoms, sudden startings, dilated pupils, facial twitching or chewing motion, and other like symptom, are often controlled by it and convulsions averted.

Solanum nigrum picture is much like *Belladonna*, while *Veratrum viride* is closely allied with *Ferrum phosphoricum*.

Local applications are of but little avail, yet with young subjects it is usually beneficial to keep the head encased in a rubber coil, through which cold water is allowed to flow, or to keep it constantly wrapped in cold cloths. I do not consider the application of ice as permissible except for a brief period at a time, if at all. During the convulsive stage it will be better to use the cold pack, with cold cloths to the head, than to rely upon warm baths.

for the purpose of relieving muscular rigidity. Especially is the cold pack and the application of cold water to the head demanded in cases arising from heat. If dependent upon suppressed eruptions, or the extension of middle ear inflammation, the application of cold about the head is harmful. If from either of these causes *Sulphur*, *Rhus tox*, *Apis* and *Gelsemium* are more likely to be needed than the remedies previously mentioned. *Rhus tox* and *Apis*, never in alternation or following each other, are especially useful in meningitis succeeding the suppression of erysipelas, while *Sulphur*, *Arsenicum* and *Hepar* are more useful if it is resultant upon middle ear catarrh or mastoid diseases.

CHAPTER XXXIII.

CEREBRO-SPINAL MENINGITIS.

General Considerations—Etiology—Symptoms and Course—Diagnosis—Complications—Prognosis—Treatment—Adjuncts—Medications—Diet.

General Considerations.—Cerebro-spinal meningitis has been known under the name of "spotted fever," petechial fever, cerebro-spinal fever, purpura hemorrhagica and other synonyms. It is only within recent years that the disease is recognized as an infectious one. Late authors are all disposed to class it among the acute infectious diseases of childhood under the name of infective cerebro-spinal fever. It is among the most malignant diseases of child life and is exceedingly fatal. It is characterized by inflammation of the membranes of the brain and spinal cord, and is likely to be attended by convulsions, paralysis and death; cases recovering being apt to be afflicted with partial or total blindness, deafness, hemiplegia or paraplegia. The disease has been known for several centuries; in eastern countries it still passes under the name of "the plague." Throughout the West and Northwest portions of the United States it is commonly known as spotted fever. It occurs usually as an epidemic, although it may appear sporadically or endemically. It is seen more especially in the late winter months and is not known to exist in tropical countries. My experience with it has been largely limited to the months of February, March and April, when in association with cold weather the winter is breaking and cold rains and alternations of thawing and freezing are experienced. It is more common to malarious districts, in sections of country not too far South to experience considerable winter weather. In Northern Texas, Northern Louisiana, Arkansas and the Northern portions of other Southern states it occurs in the latter part of the winter more often than it is seen

in the extreme Northwest. It is also commoner along the lake shore than in the dryer sections, seeming to require a combination of cold and moisture for its best development. Like all other malignant diseases it attacks those living in unhygienic surroundings and subjects who are illy nourished and improperly housed. Overcrowding of children in illy ventilated school houses, and in dilapidated or damp tenement houses in sections of cities that are poorly drained and sewered is one of the most prolific causes of epidemics or epidemics of cerebro-spinal fever. It is seen in mountain towns supplied with water from springs impregnated by minerals or befouled by dead animals. But it must not be understood that cerebro-spinal fever is limited to the hovels of the poor and the lower classes. It occasionally strikes terror to the best of homes, and, like diphtheria and scarlet fever, it is not always directly traceable to unsanitary conditions; yet in the majority of instances, if the cause of its existence is sifted carefully, it will be found that the child ill with this type of meningitis has been exposed to severe cold and damp weather, or to the noxious influence of sewer gas or other unsanitary air during the prevalence of cold, damp weather. It is also seen in children who have been chilled while skating, or who have broken in the ice, or got their feet wet while perspiring, sudden severe chilling from this cause resulting in cerebro-spinal congestion that eventuates into typical meningitis.

In the ordinary sense of the word spotted fever is not contagious, or but feebly so. Often but one case is seen in a family, and it is rare that nurses or physicians or the parents of sick children are subjects to it. The spread of this type of meningitis as an epidemic or even endemically is not traceable from individual to individual, nor does it follow the ordinary channels of commerce. It may prevail extensively during a single season in a large number of cities or towns and in numerous sections of one city or town without having direct association. It is often shown that it is possible for it to be communicated by fomites but not carried from house to house.

Cerebro-spinal fever is seen more commonly in children under five or six years of age, even attacking nursing infants. It is next most common during the second five years of life, and is seen all too frequently in the later years of youth and the early years of manhood. It is rare that a case is met with after the thirtieth year of life. The health records of the United States show that it has appeared epidemically in nearly all the large cities, and through the daily press the profession is constantly informed of local outbreaks in valley cities and towns. For inexplicable reasons it is more likely to be seen in mountain valleys, next in towns on rich alluvial soil rather than in other districts. Made ground seems especially to be a favorite site, and swampy districts that

freeze and thaw alternately in the early spring are numerous, subjected to individual or epidemic outbreaks of this disease. When it occurs on farms it is often traceable to a foul barnyard or pig-stye to the windward of the house, or to other unsanitary condition of the immediate premises.

Etiology.—The nature of the infective virus of cerebro-spinal meningitis has not been clearly defined. In the exudation that takes place within the membranes a lance-shaped coccus, very like unto the pneumococcus, has been found, but this bacillus has also been seen in association with staphylococci and streptococci, and while more often associated with cerebro-spinal meningitis than other forms of micro-organism it is not clearly determined that it is the chief etiological factor. The fact that it occurs much more often during the winter seasons, when children are confined together in close quarters and with poor ventilation, would seem to indicate that bad hygienic influences so depress the nerve centres as to render inflammation more imminent than in seasons when children are more at play and in the open air. Whether there is developed from this circumstance a specific micro-organism that is responsible for cerebro-spinal fever, or that such a degree of vitiation of the system takes place that auto-infection occurs, is not understood. It must be remembered that by no means is the disease limited to debilitated constitutions and to children ill-housed. It occurs among robust youths who suffer under exposure and in whom sudden suppression of perspiration occurs by exposure to severe cold while heated, more especially when this condition results upon getting the feet wet while the patient is heated and by being subsequently exposed to cold.

It is pretty well settled that it is not in any sense contagious. Even when seen in a number of children in the same family in succession there will be sufficient interval between the cases to establish the fact that it is not passed from one child to another, or two or three will come down so quickly that it is self-evident the cases are all due to the same exciting cause. I recall an instance in which three children in one family were struck with fatal cerebro-spinal meningitis within forty-eight hours of each other. They had been playing in a filthy barnyard for a number of days in succession, and the fatal attack could be ascribed to no other immediate cause. The well was located some distance away from the barnyard, but to make sure it was not responsible the attending physician had an analysis of the water made without finding it sufficiently contaminated to explain the illness in the family.

The combination of severe nervous shock and sudden exposure to wet and cold seems to result in unusual malignancy of attack, and the shock to the nervous system that follows upon a skater's breaking through the ice while heated, or from any other

accidents occurring in the winter season to shock the nervous system and at the same time expose the body to sudden and severe changes, is an active factor in its malignancy.

In large cities the disease may be said to be endemic or omnipresent. In this it is much like scarlet fever; but while more fatal than the latter disease it is not nearly so apt to occur epidemically or to be communicated from child to child.

Symptoms and Course.—Cerebro-spinal fever is a sudden and violent disease. None of the infectious fevers present a more pronounced onset. It is ushered in by a chill followed quickly by high fever, pronounced prostration, general aching and muscular soreness and violent headache. The headache may be frontal at first but quickly involves the base of the brain and nape of the neck. In young subjects the characteristic brain vomiting will occur with the outcoming of the headache. The face is either intensely flushed or pale and shows much distress. The pupils are likely to be dilated, though the opposite may be true. Intense photophobia characterizes most cases and the sensibilities of the nervous system are so exalted that light, noise, touch, motion, aggravate the pain and headache. A hyperæsthetic state supervenes, more pronounced than in any other acute fever. If the child be nursing even the motion of the jaws necessary thereto will cause intense pain, while in older children deglutition is difficult or impossible. The fulminating variety or apopæctic type is easily characterized by convulsions, especially clonic opeshtonos. Within twelve to twenty-four hours from the time of the ushering in of the initial symptoms the child may be in spasms, and within another twenty-four hours life may be extinct. In this type, with the outcoming of the convulsions, and even before, circumscribed ecchymotic spots will appear over the body, especially over the parts lain upon, this giving to the disease its domestic name of spotted fever. During the chill the pulse may be very much depressed and the temperature below normal. The latter quickly climbs to 105° or 106° , or even higher, the pulse going at a terrific rate. Unusually malignant cases may die within a dozen or eighteen hours from the time of being taken ill, from paralysis of the brain. In these desperately severe cases the face will be bloated and intensely red, even to purplishness. The bronchi are soon filled with a frothy mucus which occupies the mouth and during the spasms runs out as in epilepsy. The tonic of the convulsions is so severe that the neck muscles become perfectly rigid, and in many instances the child is bowed back until the heels almost touch the head. In young subjects the hydrocephalic cry is apt to precede the convulsions, and sharp, piercing shrieks that are exceedingly shrill and heart-rending indicate the degree of inflammation and exudation that is going on in the meninges. The temperature is one of the characteristic features in meningitis. In one case occurring

under my observation it registered 110° F., the temperature remaining abnormal for some hours after death. If the brain shock is very severe, as is likely to be the case where the rigor is long continued, the pulse may be so depressed as to be but forty or fifty per minute, but as reaction takes place it beats in proportion to the elevation of temperature. If the spasms are limited to the head and trunk the head may be drawn backward until they almost touch the shoulders. Distorting spasms of the facial muscles are often seen and even divergent or convergent strabismus is present in perhaps the majority of cases. The delirium is violent, even maniacal, followed by coma as exhaustion sets in. Associated with the headache is extreme tenderness of the nape of the neck and down the spinal column as far as the dorsal region, sometimes throughout its whole geography. When the spasms are chiefly of the head, neck and thorax the regularity of breathing is interfered with and asphyxiation is present to such degree that it results in general cyanosis, especially of the face, neck and upper part of the chest.

The discoloration of the skin in cerebro-spinal fever partakes of the character of rose-colored petechia, or hyperemia, very like the rash of typhoid fever; or it may be a dusky mottling on the skin over a considerable area. In severe cases the spots are black and blue, as from bruising over the body, especially, as already suggested, over parts lain upon. A general erythema or an utricular rash will show during the height of the fever, and it is a clinical fact that in cases wherein the skin shows excessive irritation without the discoloration of purpura the cerebral symptoms and spinal convulsions are likely to be less pronounced. The bowels are usually constipated, the urine is scanty, paralysis of the bladder occurs, so that the urine has to be drawn, the tongue presents about the symptoms belonging to most fevers in children in the early stages, especially when vomiting occurs, and becomes dry, red, and pointed as the case progresses. Besides the eruptions already mentioned herpes about the mouth and over the face are common in severe cases, extending even to the neck and upper part of the trunk.

In the simplest type of cerebro-spinal meningitis, recognized as the abortive type by some authors, the case will run a course of a few days, the child suffering intense headache, especially in the occipital region, with rigidity of the neck more pronounced on the left side, nausea, vomiting, and, perhaps, mild convulsions. The abortive type of Strümpell differs from this mild form in the fact that the meningeal symptoms are seen in great intensity, and persisting only four or five days, the child recovering promptly. He distinguishes this from the mild type, in which the patient complains only of headache, nausea, pain in the back and limbs, stiffness of the neck and moderate fever, these cases occurring

during epidemics and holding about the relation to the clearly developed type of this fever that bilious remittent holds to typhoid and that scarlatina holds to malignant scarlet fever.

Cerebro-spinal fever occurring in miasmatic districts is very apt to be attended by malarial manifestations. That is, there are occasional pronounced remissions of the fever, especially from morning to evening, with evening or nightly aggravation. It is rare that these symptoms are so pronounced as to be of the intermittent type, and it is well to suggest that the remittent and subsequently the intermittent features are more apt to be seen in cases recovering, these manifestations showing during convalescence.

Diagnosis.—Cerebro-spinal fever may be confounded with tubercular meningitis. If it is presenting in epidemic form it is not likely the mistake will occur, while in sporadic cases the symptoms are so much alike that it is possible to have confusion during acute manifestations. As will be shown in considering that subject tubercular meningitis extends over a considerable period of time. The tubercular history of the cases affords its basis, there is rarely the petechial eruption, delirium is not so pronounced, and instead of coming on with violence the spasmodic contraction and rigidity of the neck are not seen until later in the course of this disease, and then rarely as violently as in acute cerebro-spinal fever.

Certain forms of pneumonia and typhoid fever present cerebro-spinal symptoms that may confuse the careless observer. If typhoid is ushered in with delirium, severe headache, retraction of the neck, intense fever and perhaps convulsions, it will be readily understood that it might be confounded with cerebro-spinal meningitis; but as a matter of fact this is not the usual course of typhoid fever, and there is greater probability of confusion occurring when the class of symptoms just described occur at the end of the first week rather than at the onset. The nomination would then lie against cerebro-spinal fever, which rarely has the prodromal period of a week before the ushering in of convulsions. Its usual course is violent from the start, while the usual course of typhoid fever is quite the reverse.

Pneumonia and meningitis may be so associated that it is with difficulty that separate diagnoses can be made; but pneumonia has cough, bloody expectoration, crepitant and sub-crepitant rales and even hepatization, or acute engorgement of the lungs, symptoms that are not present in cerebro-spinal fever. Pneumonia is more likely, however, to be ushered in by a violent chill, high fever, and the early oncoming of convulsions in children than in adults, and very much more likely to present this picture than typhoid fever.

Malignant scarlet fever, malignant small pox, typhus fever and the hydrocephaloid condition associated with cholera infantum

develop symptoms in individual cases very like unto acute cerebro-spinal meningitis; and in thermic fever and various hysterical conditions the careless observer may be confused in determination.

Purpura hemorrhagica occurring in association with pernicious intermittent fever and the purpuric types of fever generally may be confounded with the disease under consideration, unless care be exercised in making the diagnosis. The violence of onset, the alarming suddenness of delirium and convulsions, the rigidity of neck, exalted temperature, Cheyne-Stokes breathing, and the depressed, irregular pulse due to violence of brain shock will make the diagnosis of cerebro-spinal meningitis clear in sporadic cases, while there need not be confusion during the prevalence of the disease as an epidemic.

Complications.—Pneumonia is seen in association with cerebro-spinal fever, and it is difficult to differentiate pneumonia in child-life in association with convulsions from cerebro-spinal meningitis because of the possibility of the two diseases existing in the same subject; pneumonia being not infrequently associated with meningeal affections. It is especially common in the subjects of tubercular meningitis and since it is not always easy to eliminate from the history of the cerebro-spinal invalid the tubercular dyscrasia it is especially difficult in individual cases to determine whether the pneumonic inflammation is the primary or secondary disease. The pneumococcus will not settle the question since it is found in both.

Pleurisy and pericarditis are seen as complications, and articular rheumatism and purpuric effusions are complications that will be met with. The special senses may be permanently impaired; atrophy of the optic nerve or keratitic ulceration of the cornea may attend or follow upon it. Involvement of the middle ear and inflammation of the labyrinth, with permanent impairment of the hearing, are among the most common causes of deaf-mutism in deaf-mutes not so afflicted when born. Epidemics of cerebro-spinal meningitis are followed by epidemics of deafness, resultant in a large proportion of pronounced cases. Paralysis of the lower extremities and of individual nerves, severe headache, symptoms ordinarily classed as "spinal irritation," such as sensitiveness of the spine in the dorsal region and at the base of the brain, and even impairment of the intellect follow in the train of cerebro-spinal meningitis. In truth, it is one of the most malignant and destructive diseases of child-life.

Prognosis.—The mortality varies according to the severity of the epidemic. This is usually influenced by climatic conditions the severest epidemics occurring in the late winter months or in unusually severe weather in mid-winter. In the typical epidemic or when cerebro-spinal fever shows as endemic to a circumscribed

section, especially an unsanitary portion of a crowded city or of a town built on made ground, the mortality rate may range as high as from fifty to seventy-five per cent. In sporadic cases children recover after a long and tedious illness and with more or less impairment of the individual functions, rarely with complete recovery, in from twenty to thirty per cent. of instances. Especially unfavorable symptoms are long continuance of convulsions, profound depression of the heart's action, persistent vomiting, and distressfully impeded respiration. In the fulminating variety the mortality is greater. The prognosis is affected by the previous health of the child, delicate systems being rarely able to stand the severe shock to the brain and nervous system that result from the violent convulsions belonging to the disease. Robust children are more likely to recover, provided a fatal issue is not seen in the first four or five days. The convalescence is almost always retarded and in no disease of child-life is there such profound shock to the nervous system and such manifest evidences of severe brain suffering.

Treatment.—The treatment of cerebro-spinal fever to be effective must be prompt. It should combine both local and constitutional measures in so far as possible.

ADJUVANTS.—These will consist of the application of hot mustard baths to the feet, or a general hot bath, in order to relieve in so far as possible the determination of the blood to the brain and spinal cord. Where convenient, as the attack is ushered in, children should be subjected to a bath as hot as can be borne, and immediately wrapped in a hot pack, care being taken, of course, not to do injury to the integument. While this is being done cool applications, never ice cold, should be applied to the brain. The practice of shaving the head and applying the ice cap is not permissible, but it may be allowable to shave the scalp and apply water severely cold through the rubber coil, the body, arms and legs being wrapped in blankets wrung from hot water over which dry sheets are wrapped. Hot baths may be repeated during the convulsive stages several times in the twenty-four hours, and are especially demanded if the extremities are cold and mottled. If the back of the neck and spine are intensely hot they may be repeatedly subjected to cold baths, or splashings of cold water, or even the temporary application of ice or cloths wrung out of ice water; but ice should never be long continued. The room occupied by the patient should be kept dark because of the hyperæsthesia retineæ, and since convulsions are excited by the slamming of doors and jarring of the floors, the room should be kept as quiet as possible.

MEDICATION.—The remedies most useful for acute inflammatory meningitis are those suited to inflammations of serous membranes, *Aconite*, *Belladonna*, *Gelsemium* and *Dryas* generally taking the lead. *Ferrum phosphoricum* is hardly acute

enough in its pathogenesis, and *Veratrum viride* has not been found as useful as in passive congestions of the brain and cord.

Aconite is recommended by Hughes as perhaps nearer the similitum than any of the remedies named. If the case be ushered in by a violent chill, followed quickly by high fever, with the usual *Aconite* symptoms of intense, dry heat, thirst and restlessness, head hot, full but compressible and rapid pulse, the temperature quickly mounting to 103° or higher, especially in cases occurring in cold, damp weather from raw winds and exposure and sudden suppression of the perspiration, *Aconite* in the lower attenuations will often overcome the engorged condition of the membranes and check, or modify the inflammatory features of the case. It is not so useful after convulsions have set in.

Belladonna is perhaps the most useful of all of the remedies named. It is especially applicable to full, plump children who have violent congestive symptoms. The pupils are widely dilated, the face intensely flushed, or very pale, with cold extremities, the head drawn back on the shoulders, convulsions occurring in regular paroxysms, or ecchymotic spots showing early, with general cyanosis of the face, neck and upper part of the chest during the convulsions. Mouth hot and dry, with constriction of the throat, violent cramping of the throat muscles and distortion of the eyes, injection of the conjunctivæ. *Belladonna* is one of the noblest remedies in the materia medica in the early stage of cerebro-spinal meningitis, especially the convulsive stage, and is often the genus epidemicus covering a large number of cases.

Gelsemium is the *Belladonna* of malarious districts. The child is intensely hot but not as dry as with *Belladonna*, nor are the mouth and throat so dry. The eyes are injected but the general congestive appearances are not as pronounced as in *Belladonna*, spasms are not so violent, consisting more of the drawing of the neck and head to one side and backward. Rarely of use in cerebro-spinal epidemics occurring in extreme Northern districts it is among the best of remedies for this disease when seen in miasmatic sections or in the lower temperate zone. It is also useful for the local paralyses that follow upon cerebro-spinal fever.

Bryonia.—Its well-known affinity for serous tissues properly gives *Bryonia* high place in the treatment of cerebro-spinal fever. It is especially called for when this disease is seen in association with pneumonia, and when it follows upon the recession of eruption or when associated with acute rheumatism. The headache is intense, and greatly increased by motion; the spasms are excited by moving the child, by the slamming of doors and other sharp noises.

Cupressus acetosæ is especially recommended in connection with *Cicuta* by Goodno. I have not used this remedy, therefore

cannot speak of it clinically. Its pathogenesis covers the tonic spasms of cerebro-spinal fever fairly well.

Cicuta is indicated in cases suffering from tonic spasms of the feet and hands especially. Also when the feet and hands are in rigid convulsive states and the head is drawn backward on the shoulders, more to the left side. I have used this remedy in the convulsions of the hydrocephaloid condition of children suffering with summer complaints with good results but have never used it with satisfaction in meningitis.

Helleborus is more applicable to the tubercular variety but will be found useful in cases of acute cerebro-spinal fever when its characteristic symptoms are present. Spasmodic rigidity of the arm and leg of one side, with constant thrashing of the limbs of the opposite side; insistent rolling of the head to and fro, the child being unconscious, the spasmodic condition being more limited to one side of the body and not seriously involving the neck and shoulders.

Hyoscyamus is applicable after the convulsions have subsided. The child lies stupid and unconscious, or there may be mild delirium, with grasping at flocks and sudden startings. Either retention or incontinence of urine is usually present in the *Hyoscyamus* case.

Glowworm may be prescribed with success in individual cases occurring during intensely hot weather, partaking of the fashion of sunstroke. It is doubtful if genuine cerebro-spinal fever is met with in midsummer, but a condition so allied to it that it is difficult to differentiate the two is seen in children who have been exposed to intense heat of the sun, and in these cases *Glowworm*, *Belladonna*, and *Gelsemium* will be found especially applicable.

For the paralyzes following cerebro-spinal fever it is recommended that *Zincum*, *Cocculus*, *Gelsemium*, *Lachesis*, and *Hydrocyanic acid* be carefully studied. *Physostigma*, *Agaricus*, and *Nuxvomica* may also be found useful.

Diet.—It is next to impossible to feed the cerebro-spinal subject during the acute course of the disease. Swallowing is not possible as the patient is either in convulsions or unconscious most of the time. Nor is it necessary to pay much attention to diet for two or three days in most cases. It is remarkable how children can get along without nourishment when ill. Water should be given ad libitum, and an advantage of the bath is that quantities of water will be taken into the system in this way. Copious rectal enemata should be administered during the acute febrile stage, except when the patient is in convulsions, and even here in occasional cases the cold pack or cold baths should be used instead of hot baths, which are often found beneficial during the violence of the convulsions. If the convulsions be especially associated with intense heat the cold pack will be bet-

ter at that time. Water takes the place of food in the acute types of fever in child-life to a certain extent, and if they be allowed to drink freely, and if copious rectal enemata be used as suggested, but little nourishment will be required. As the case progresses it may be necessary to resort to rectal alimentation. After thoroughly cleansing the rectum with cool water, even to douching of the colon, injections of lean beef-broth, Bovinar and milk or Murdock's Liquid Food may be given per rectum every four or six hours. These are more quickly absorbed if administered warm, which should be done, unless contra-indicated in special preparations. Feeding by the mouth may be begun as soon as the child is sufficiently conscious to take nourishment and be able to swallow it. Necessarily the diet will have to be liquid and here the simpler the preparation the better. Highly concentrated nourishment is not easily assimilated soon after the severe nervous shock the system has undergone. Milk is generally objectionable, but may be administered pasteurized or mixed with Valentine's beef juices or Bovinine. Beef-broth and mutton-broth are allowable and buttermilk is permissible if the child will drink it. Care should be exercised in the matter of diet for some weeks after the subsidence of the acute symptoms lest indigestion result in secondary convulsions. Later a more liberal diet may be required, and if the child shows great emaciation and systemic shock it may be well to resort to the use of special nitrogenous foods, as Angiers' emulsion, Phillips' digestible cod liver oil, or the plain article as prepared by Squibbs.

CHAPTER XXXIV.

TUBERCULAR MENINGITIS.

General Considerations—Symptoms and Course—Stages—Diagnosis—Prognosis—Treatment.

General Considerations.—The meningitis of tuberculosis is set up by the presence of tubercles in the blood vessels, especially at the base of the brain. This variety forms perhaps full one-half of the cases of inflammation of the meninges. It is seen in miliary tuberculosis, but more commonly as tubercular meningitis toward the close of the general tuberculous process in children. Typical cases of hydrocephalus are usually of tubercular origin, as acute meningitis during the teething process, with the hydrocephaloid symptoms common thereto, is also dependent in good measure upon a tubercular state. It is less common in children

under two years of age than simple or purulent meningitis, but is more common between the ages of early infancy and puberty. Tubercular meningitis is usually secondary to the presence of tubercles elsewhere. Tubercles are seen upon the blood vessels of the brain, and even in the form of gray granulations or cheesy tubercles in other parts of the body, prior to the development of meningitis. It is seen in children suffering from hip-joint disease, in caries of the vertebrae or tuberculous degeneration of the cervical or other glands. It is also attendant upon measles or whooping-cough in tuberculous children, the presence of the acute diseases serving to light up the tuberculous process, whose force is then spent upon the brain. It is more common to children who are ill-nourished, and to infants who are fed upon artificial foods from earliest infancy. During school life it is developed by the over-application of precocious children to their studies. It is a clinical fact that delicate children are often among the more intellectual of their classes and possessed of intellect out of proportion to their physical strength. In these subjects tubercular meningitis develops with ordinary acute diseases, or even independent of such causative factor. It is difficult to understand why the tubercular process should attack the meninges of the brain, instead of locating upon the bronchial glands or in other glandular structures, as is the rule; yet its affinity for tissues like the meninges, the peritoneum, joint structures and pleura is acknowledged, and of these structures the meninges of the brain are among the most frequently affected.

Symptoms and Course.—Tubercular meningitis comes on insidiously. It attacks children of delicate structure in whom there is previous malaise, with dyspeptic symptoms, cough, enlarged glands, more or less of feverishness and perhaps suppurative disease, either of glandular or bony structure. In other cases the only symptom which will be remembered to have preceded an acute attack of tubercular meningitis is headache, especially in school children who have been studying closely. Muscular debility, indisposition to take part in the games of child-life, irritability of disposition, or indifference may characterize the child's habits for a number of weeks or months prior to the development of cerebral symptoms. This premonitory stage is irregular and perhaps it is only the headache, occurring with ever increasing intensity and more frequent paroxysms, that has given inconvenience to the patient up to the time of the development of the stage of excitement, due to the lighting up of tuberculosis of the meninges.

In very young children it may come on suddenly and a fatal issue result within a few days, in which event there is sudden, spurting vomiting, convulsions and coma, the child having previously enjoyed apparent good health.

STAGES.—The typical case of tubercular meningitis presents three well marked stages, the stage of excitement, the stage of transition and the stage of coma. The first, or stage of excitement, is likely to be characterized by gastric symptoms and sudden and persistent vomiting. This may at first be attributed to indigestion, but it continues in spite of repeated changes of diet, and is usually accompanied by a clean tongue and absence of the usual symptoms of the indigestion of child-life. Instead of the vomiting of gradual, oncoming meningitis showing anything characteristic, as is usual in the acute manifestations of early infancy, it is not unlike the ordinary emesis of deranged stomach except that it may present an erratic course, coming after meals, before meals or between meals, in some cases being directly attributable to food in others occurring without any apparent cause. The child is usually constipated, and if brain symptoms are developing at this stage they consist of headache, irritability, disposition to remain quiet, and intolerance of light and noise. If a child of three or four years of age it likes to lie quiet and takes no interest in its toys or the games of its playmates. If older, and at school, besides the nausea and vomiting there is likely to be headache and pain. Returning from school the child will seek its couch and prefer to lie quiet for hours at a time in order to obtain relief from the headache, and to be freed from the annoyance of light and noise. There is giddiness and staggering out of proportion to the severity of the headache. The pulse is quicker than it should be, the tongue coated, the bowels constipated, and although quick to return to its studies the child is indifferent to what is going on about it. Younger subjects who have suffered severe attacks of vomiting, who are showing symptoms of debility and who have been having the premonitory symptoms of headache and irritability over a period of a few weeks, are apt to waken from disturbed sleep with the sharp, hydrocephalic cry characteristic of meningeal involvement.

Remissions occur between the acute manifestations described, and thus the course of the first stage will drag itself along for weeks or months with gradual loss of strength, gradual decrease of appetite, gradual and progressive emaciation, the general course of the case being downward.

The second stage is characterized by the commencement of dullness and drowsiness, the child is no longer fretful and irritable but likes to remain quiet. The vomiting will have ceased, the abdomen is retracted and the bowels confined. Photophobia is pronounced because of the optic neuritis which has taken place; the edges of the retinal discs are blurred and indistinct, the veins are distended and tortuous, the discs swollen and congested. Miliary tubercles are seen in the choroid under ophthalmoscopic examination; muscular twitchings, spasmodic contraction of the muscles

of the neck and limbs, various paralyses, especially of the muscles of the eye, face and limbs on one side, incontinence of urine and feces, irregularity of respiration, and, finally, general convulsions occur during the close of the stage of transition.

From this condition the child passes on into one of complete drowsiness. The tongue is coated, sordes appear on the teeth, lips and tongue as in typhoid states. The skin is harsh and dry, the pulse weak and rapid and the temperature increased but not as high as in miliary tuberculosis. From what was a condition of drowsiness or stupor at first the child passes on into a condition of coma, the temperature is remittent and irregular and local paralyses or temporary paresis, as paralysis of an arm or leg or partial anesthesia, are seen. As the coma becomes more profound the child becomes wholly unconscious, pays no attention to anything that is going on about it and cannot even be aroused for nourishment. The stage of nervous exaltation and excitement having passed into the stage of transition, during which convulsions are most likely to occur, this in turn has been followed by the stage of coma or collapse, during which death is certain to occur.

Diagnosis.—The whole course of the acute manifestation of tubercular meningitis may last from three to six weeks, but it may be months from the time the initial symptoms of illness are seen until the fatal issue occurs. In very young children early symptoms are spitting vomiting, rigidity of the muscles of the neck with retraction of the head to one side and backward, facial twitching and clonic spasms of the leg or arm; or it may be, if the child is erupting a number of teeth in quick succession or at one time, that convulsions will be the first symptoms beyond the irritability, fretfulness and feverishness of the teething process. The fontanelles are full and bulging, the anterior fontanelle especially, and the veins of the forehead are more prominent than usual from accumulation of fluid in the ventricles. The retraction of the head just described is very characteristic but not absolutely diagnostic, occurring also in chronic meningitis and in connection with acute inflammation of the lungs with the development of brain symptoms, and also in acute inflammatory conditions of the abdominal viscera.

Collection of fluids and softening of the brain, as described under the old name, acute hydrocephalus, belong to tubercular meningitis. The pia mater is the real site of the tubercular process, but tuberculous granulations are found in the gray matter of the brain and cord and on the blood vessels in the immediate vicinity. Exudation also occurs in serous or sero-fibrinous form, and the convulsions and paralyses are doubtless due not more directly to the inflammatory conditions that are going on than to the pressure that is the result of its effusion. It is in tuberculous

subjects in whom the meninges have become affected by the introduction of the bacillus of tuberculosis that tubercular meningitis is most frequently seen. It is considered doubtful whether it occurs as a strictly idiopathic inflammatory process depending wholly upon general tuberculous conditions for its basis, and it is now thought to be due almost invariably to direct local infection of the meninges by the tubercle bacillus.

Its vomiting will have to be differentiated from the vomiting of acute or chronic indigestion. When occurring suddenly or violently, as in the youngest subjects, there is but little difficulty in tracing its origin to commencing brain inflammation. When occurring in children of from three to four years up it will be differentiated from the vomiting of indigestion by the clean tongue and the failure to associate it with regularity with special foods that are known to cause the indigestion of children. The convulsive seizures are of the epileptiform type. They may be local or general, lasting for a few moments or for hours. The headache, especially after convulsions have set in, is intense. Emaciation occurs rapidly, the mental faculties which have heretofore been unusually bright and acute, even to precocity, show dullness, and strabismus and facial twitchings, with rigidity of the neck, accompanied by the hydrocephalic cry, will help to diagnose it from the ordinary clonic convulsions of abdominal irritation or the teething process. The presence of constipation is a diagnostic symptom of some value, and the early contraction of the pupils with intense photophobia, due to oncoming optic neuritis, followed later by sluggishness of the pupils and the ophthalmic picture of hemorrhagic spots, swelling of the discs and engorgement of the choroid, will assist in determining the tubercular form of the brain disease that is going on.

From cerebral syphilis the diagnosis will be made by the age of the subject, the brain pains of the latter disease belonging to youth or middle life and, if occurring in children, being always worse at night and associated with syphilitic teeth and other general syphilitic symptoms that will assist in making the diagnosis clear.

Prognosis.—Tubercular meningitis is almost invariably fatal. In fact, it is doubtful if any sufferer from tubercular inflammation of the meninges that has gone on to general convulsions and coma has ever recovered. It is possible, doubtless, for a cure to result if the case is seen in its initial stages and is promptly met by anti-tubercular treatment, the same rule applying here that applies to tubercular diseases of other organs, although of course it is to be admitted that when tuberculosis of the brain occurs the disease has affected the great central nervous organ and is even more likely to be dangerous than when the lungs are its seat. I am sure that I have carried more than one patient out of

tubercular inflammation of the meninges with safety, the symptoms occurring as acute manifestations prior to the lighting up of the general tubercular state. I have never met with a case in which the tuberculous condition of the patient was pronounced in which there has been the slightest hope. The prognosis is always grave, generally fatal.

Treatment.—The proper treatment of tubercular meningitis will turn upon the administration of the constitutional remedies that are known to have direct influence upon the tubercular process. The acute meningeal symptoms developed during the course of cholera infantum, acute military tuberculosis, and acute general tuberculosis in child-life, will have to be met by remedies suited to acute inflammatory affections of the meninges, as *Acovite*, *Bryonia*, *Helleborus*, *Apis*, *Ferrum phosphoricum* and *Gelsemium*; but the constitutional treatment of tubercular conditions as meningeal symptoms begin to show themselves will depend not more upon the exhibition of these remedies than upon those adapted to the tubercular dyscrasia. Among the latter iodine and sulphur stand first, although *Lycopodium* plays an important part in the treatment of developing tubercular states, following upon the recession of measles or other eruptive disease. Of the preparations of iodine the *Iodide of Arsenicum*, *Iodide of Calcareo*, *Iodide of Baryta*, and, later, *Iodoform*, as well as *Iodium* without combination, have all been found useful.

Arsenicum iodatus is especially applicable to scrawny children, with enlarged and indurated glands, who emaciate quickly and in whom commencing consolidation is noticed, especially in the bases of the lungs prior to or co-incidental with the development of cerebral symptoms. In hepaticization of the apices this remedy is also useful. The general constitutional state or dyscrasia is that of iodine, while the febrile symptoms are more those of arsenic. Headache in the afternoon and after midnight, restlessness, apprehension, debility, languor, loss of appetite, dry, teasing cough, quick emaciation, enlargement of the mesenteric glands, and commencing cerebral irritation will many times find their counterpart in the *Iodide of Arsenic*.

Baryta iodatus is better suited to the meningeal headaches in school children who are approaching the age of puberty, who have grown rapidly and whose glands, especially the tonsils, are enlarged. The *Baryta* child has a large head, scrawny neck, unhealthy hair, hypertrophied tonsils, ungainliness of gait, developing slight hacking cough, without preceding exposure, and heaviness of head, rendering study difficult.

Calcareo iodatus is more applicable to younger subjects with distended abdomen, emaciated limbs, cervical glandular enlargement, with headache and sweat about the head and neck while sleeping. Patient anemic, hands and feet cold and, perhaps,

moist. In children who have been ill nourished from birth, in whom the teething process has been slow, with gastro-intestinal disturbances, not yielding promptly to treatment, *Calcarea iodata* will be found more useful than other preparations of iodine.

Iodoform has recently been administered with success in the lower attenuations. According to Gooden, in old-school treatment it is applied externally in the form of an ointment over the head after shaving the scalp. The ethereal solution of *Iodoform* has been used by Wilcox, of New York, with success in tubercular abscesses. This drug has not been proven, and I think we may safely prefer to use other preparations of iodine, though in tubercular abscesses its local exhibition may be attended with benefit.

Sulphur, perhaps next to iodine and in some cases superior to it, stands prominent as a remedy for the tubercular dyscrasia with meningeal tendency. The *Sulphur* child is odd and scrawny; its bowels are always torpid, its appetite capricious, its skin unhealthy. It is especially applicable where meningeal symptoms develop from the recession of eruptions, more especially chronic skin diseases, while *Lycopodium* will be found more beneficial in cases developing lung or meningeal symptoms, or both, following upon measles. After meningitis shall have set up and the symptoms developed acutely other remedies than these will be needed.

Apis is especially valuable in the hydrocephaloid cry of teething children; sudden suppression of diarrhea with associated development of brain symptoms; child shrieks fiercely; cries out suddenly in sleep; head hot and burning; child is restless and irritable but not thirsty; acute development of brain symptoms in association with erysipelas, urticaria, scarlet fever and other acute exanthemata in tuberculous subjects.

Helleborus is adapted to subjects in whom apathy is the prominent feature; the child bores its head backward in the pillow. The *Apis* case rolls its head from side to side. The *Helleborus* case has heat of head, forehead wrinkled, eyes drawn upward, corrugation of the muscles of the forehead with chewing motion of the mouth (*Bryonia*). Paralysis of one side with constant motion of the arm and leg of the opposite side; child listless, cannot be aroused. When the constant motion of the head presents the suggestion of *Helleborus* the case will be differentiated from that of *Apis* by the difference in the mental state. With *Apis* there is excitement, shrieking, piercing cries and sporting brain vomiting; with *Helleborus* the child is quiet except for the automatic movements of the arm and leg and the backward boring of the head; tendency to chronic spasms; child lies unconscious and uncomplaining.

Belladonna will be found useful in acute tubercular meningitis which comes on suddenly by metastasis of scarlet fever, erysipelas or cholera infantum. Convulsions usher in the disease; patient's

face is flushed, eyes injected, carotids throbb and pulsate; opisthotonus and general tonic spasms pronounced.

Bryonia, already mentioned in connection with *Helleborus*, is an excellent remedy in meningitis because of its well-known affinity for serous membranes. There is constant chewing motion of the mouth; patient cries with pain upon being moved or jarred; the bowels are constipated, and perhaps there has been a sudden recession of eruption or amelioration in rheumatic symptoms. While not especially adapted to the tubercular form of meningitis yet *Bryonia* may be found useful when its characteristic symptoms are presented. As in pleurisy and synovitis it is one of the best of remedies after effusion has occurred.

Caprum vesiculosum may be required for the clonic convulsions that attend upon tubercular meningitis in young children, especially in association with cholera infantum; spasms of the thoracic muscles; extreme extension of the fingers and feet in clonic spasm; the head and face drawn to one side and downward; spasm of the muscles of the jaw and neck, amounting to trismus.

Gelsemium, *Aconite* and *Ferrum phosphoricum*, especially the first-named remedy, will be demanded in the tubercular meningitis that sets up suddenly with intense fever, restlessness, thirst, and the characteristic symptoms of this remedy. In *Gelsemium* the expression is more besotted, the pupils dilated, the head drawn backward, the fever bounding from one to two degrees above normal to 104° or 105°; the skin is moist, the child is semi-conscious, and upon being lifted from the bed its head is drawn backward with rigidity of the muscles of the neck and spine.

The *Aconite* child has a more intense fever than the *Gelsemium* case, is intensely thirsty, hot, dry burning skin, great restlessness, in fact, the usual symptoms of *Aconite*, no matter what the disease.

Ferrum phosphoricum occupies a place midway between *Aconite* and *Gelsemium*. The skin is dry, yet not so hot and pungent as with *Aconite*. The fever is more like the *Gelsemium* fever, and yet there is not the opisthotonic state of the muscles of the neck and back. It is especially beneficial in meningitis occurring in association with acute articular rheumatism; metastasis of inflammatory rheumatism from the joints of the meninges in tuberculous children.

Various remedies will be found useful in combating special symptoms that arise during the course of tubercular meningitis.

Opium in the medium attenuations or very high is useful in the profound coma that is sometimes seen in this connection.

Coffea may be required to give rest from the continued wakeful state that increases and aggravates the brain symptoms.

Valerian, *Nux vomica* and *Morhus* may be needed for the same purpose.

Cantbars will be required if with the development of brain symptoms, especially from the recession of vesicular eruptions, there is either retention or suppression of urine; strangury with hot, scalding, burning urine; the child's skin so intensely hot as to be pungent to the touch.

Hyoscyamus, *Stramonium*, *Monobromide of Camphor*, *Glaucium*, *Cannabis indica* and *Aethusa* may be required to meet special indications.

In a general way the antispasmodic constitutional remedies, *Sulphur*, *Calcarea*, *Iodine*, *Kali carbonicum*, *Psorinum*, *Lycopodium* and analogues will render good service in the wasting of tubercular inflammation of the brain in tuberculous children. Once established, it is exceedingly difficult of treatment, requiring painstaking differentiation according to the individual symptomatology of the case.

For boring of the head in the pillow *Apis*, *Belladonna* or *Bryonia* is demanded; for automatic rolling of the head from side to side *Helleborus* or *Zincum*; if clonically drawn to one side the latter remedy and *Stramonium* which also covers raising and sudden drooping of the head backward. For excessive sweating of the head *Calcarea carbonica*, *Calcarea phosphorica* or *Silica* is especially demanded. Intense heat of the occiput calls for *Belladonna* or *Zincum*. If with this heat the hands and feet are cold *Belladonna* is more than ever indicated. For violent jerking of the head in spasms, *Cicuta*. Automatic rolling of the head in association with summer complaint may call not only for *Belladonna*, *Helleborus* and *Zincum* but also for *Eutrophyllum*, prior, however, to the actual development of meningeal inflammation. If the pupils are contracted *Cyclamen*, *Opium* or *Veratrum* may be required. If widely dilated, *Belladonna*, *Cicuta*, *Helleborus*, *Hyoscyamus* or *Glaucium*, is called for. If the eyes be rolled upward *Cicuta*, *Helleborus* or *Apis* is likely to be indicated. Sudden, spurting brain vomiting may require *Apis*, *Helleborus* or *Aethusa*, and if with the sudden oncoming of meningeal symptoms there is a gushing outpouring of the contents of the bowels with relaxation of the sphincter muscles *Phosphorus* or *Apis* will be required. These two remedies alone have this paralysis of the rectum in association with brain symptoms. With *Phosphorus* the child is relaxed, debilitated and unconscious. With *Apis* there is the wild delirium or shrieking, piercing brain cries of the hydrocephaloid state with paresis of the rectum and sphincters.

CHAPTER XXXV.

ACUTE INSANITY.

General Considerations—Melancholia—Chronic Insanity—Maniacal Insanity—
Hysterical Insanity—Acute Mania—Diagnosis—Prognosis—Treatment.

General Considerations.—Insanity is not very common to child-life, children not being subject to its manifestations as frequently as adults are; and while the consideration of the subject properly belongs to works on neurology, yet it is not improper to briefly consider the subject here. Insanity is much more likely to manifest itself in children of weak, nervous systems and defective intellect. It is usually of the simpler varieties, because the mental faculties have not been well organized and drilled in special lines of thought. Hallucinations are especially common in the insanity of child-life, causing no effort on the part of the mind in the line of organized thought for their creation. Cases are recorded in which children have been born insane, one reporter of the subject showing numerous instances of cases occurring as early as three and five years. There is usually an association of chorea, epilepsy, and hysteria, with disabilities of the mental function, the psychoses of children partaking of the form of hypochondriacal insanity, melancholia, hallucinations, acute mania, or moral insanity. The latter is especially likely to manifest itself in children approaching the age of puberty, although it is seen in younger subjects. Perhaps the majority of cases of mental derangement of children have syphilis as a base, but it is not uncommon to witness mental mania and the opposite, hypochondriasis, following upon acute fevers. Recession of the various eruptive diseases are frequent causes of acute disturbances of the brain. There are numerous transitory psychoses met with in child-life. Some children seem to predispose to delirium upon slight cause, becoming delirious with the smallest febrile reaction. These children are likely to have nightly terrors and, particularly, hallucinations, becoming hysterical from their anxiety or remorse, and evidencing severe mental suffering without adequate cause.

Melancholia.—This is not common to children of early years, but is occasionally seen in the form of unusual sadness and depression, the child not being interested in the affairs of children and brooding over some imaginary wrong it may have done its play-fellows, or exaggerating some act of disobedience to its parents until it is rendered exceedingly unhappy and believes itself deserving of severe condemnation. This is especially likely to occur in deeply pious families whose children are brought up in constant fear and

apprehension that some thoughtless act will subject them to everlasting condemnation. Melancholia is also seen in children who are ill nourished and whose lives early become a burden. It is not uncommon as a reactionary condition in children of especially nervous and sensitive organisms who meet with disappointments and deprivations that they feel are greater than they can bear, and by encouraging the habit of brooding soon become pronouncedly melancholic.

Choreic Insanity.—This type is common to the initial weeks of chorea major, but is rarely seen in the minor form. It follows upon disturbances of the nervous equilibrium, from loss of sleep, severe suffering, and from a high state of nervous excitement from chastisement. It breaks out as violent manifestations of mania in children who are clearly choreic. There are no especial differences in the manifestations of this type and those of acute mania from other causes. It is more like the mania of hysteria than any other form. Such children become uncontrollable and highly hysterical; they strike, bite, jump up and down, throw themselves upon the floor, hurl themselves against the wall and furniture, and scream at the top of their voices, falling in hysteriform spasm. These manifestations are more common to children in whom chorea is engrained upon rheumatism. It is especially common to choreic children who are half-witted.

Maniacal Insanity.—While maniacal insanity may precede or follow upon epilepsy occurring in children just as it does in adults, it may be that some weeks before the first epileptic attack the child may have maniacal outbursts, the cause not being understood and only determined upon the appearance of a genuine epileptic seizure. It is rare that a child of eight or ten years of age has well-pronounced epilepsy without attacks of mania preceding or following the spasms, such children differing from ordinary children in that they are exceedingly perverse and self-willed, coarse in their manners, disobedient, and not to be relied upon. Independently of the convulsions they may have attacks of blind fury and rage, during which they are quite uncontrollable. It is often difficult to determine whether such children need moral restraint or medical treatment.

Hysterical Insanity.—Not often seen prior to the sixth or seventh year of age, from that time on until puberty this type is much more common. It is more often seen in girls, although boys of delicate nervous organizations are not exempt. The subjects of this form of mental disturbance afford an interesting study and opportunity for the exercise of patience and good judgment in their management. Children otherwise normal refuse to talk, and apparently cannot speak; all communication with their playfellows and family is carried on by pantomime; or it may be that the hearing seems to be affected, or that the child acts as though

blind; or it may assume the cataleptic or trance-like condition and lie persistently motionless, and as though unaware of everything going on about him. These manifestations cause deep concern on the part of the parents, and they are quite at a loss to know what has come over the child. Deceptions are practiced, and a child who has been previously reliable may become so dishonest as to hide various articles and know nothing of them. Sensational deceptions of extreme character are practiced, and if the condition be allowed to progress the subject becomes sullen, capricious and eccentric. Most extravagant and unnatural acts are performed by hysterical girls during the development of this form of mania, and many of the mischievous and outlandish pranks of girls in their teens, some of which bring them into disrepute, are the result of hysterical insanity that is not recognized as such by the physician and friends. Doubtless in many cases of this character the sexual system is at fault, and careful investigation in regard to the condition of the external genitalia, especially the clitoris, will remove the cause and restore the mental equilibrium.

Thorough study of the mental health of children is likely to show all deviations from normal to perverted mentality arising from morbid propensities, monomanias being looked upon as types of insanity. Lying and stealing and malicious destruction of toys, especially those of other children, extravagance in the demands of child-life, and unreasonableness of action generally, are classed as abnormal mental states, and treated of in extenso by Maudsley and other authors on insanity as on the border-line of mental disease. Specially important features are given separate consideration, and are considered of sufficient importance to have had special names assigned, as pathophobia, or morbid fear of disease; mysophobia, or fear of contamination or defilement; agoraphobia, or fear of streets and open places; monophobia, or fear of being alone; pyrophobia, an abnormal dread of fire or being burned; atrophobia, special fear of lightning; hydrophobia, a mortal dread of being attacked by hydrophobia. Usually delicately constituted children are the subjects beyond question of extreme fears in many directions, and are rendered exceedingly unhappy thereby; it is doubtful, however, if it is desirable to class all these morbidities as individual types of mental disease; they are hardly deserving of this degree of importance. Yet in individual cases the phobias are so extreme as to blight the child's life and happiness, and to demand treatment just as do the more violent manifestations of mania. As the age of puberty approaches, and even very much earlier in life in individual cases, nymphomania is present as among the most distressing of the types of mental derangement. It is directly due to sexual neurosis, and has its basis, in many cases, in boys in adherent or unusually redundant foreskin, and in girls to adherent labia-minora or unhooded clitoris. It may

also be excited by the presence of worms, or be due to unusual inflammatory irritations about the vulva; in other cases it seems to be of central origin, and if traced to its fons et origo the blame will rest with the parents, who have been unusually indulgent in sexual appetite during the early weeks of intra-uterine life of the child. The most extravagant and indecent exposures of the sexual organs characterize these cases. Masturbation even at tender years is associated with nymphomania. A case occurred in my practice in Texas in which a boy of six years was given to most extravagant habits in this direction, his practices entailing an extreme degree of neurosthenia, and eventuating in chorea and epilepsy. He is at present an inmate of an imbecile asylum.

Acute Mania is the form of insanity most commonly seen in child-life. It is an attendant, in most cases, upon supposed eruptive fevers or severe attacks of acute fever, and belongs also to the meningeal diseases of infancy. Its outbursts are extremely furious, presenting all the characteristics of acute mania in adult life. Rage, cursings and vile language, biting, striking, and destructive tendencies generally, wildest exhibitions of fury and vicious convulsions are seen in the acute manias of children. Its attacks are attended by increase of temperature, and extreme soreness of the mucous membranes of the mouth and throat, preceded by frothing and copious discharge of mucus therefrom. Such maniacal children scream at the top of their voices, fight, kick, tear their hair and clothing and are disastrously destructive. In special cases homicide or suicide occurs as the result of their outbursts. For more complete classification and description of insanity of children it will be necessary to refer to works treating wholly as this type of disease, as the subject is an exhaustive one, and deserving of much more attention than can possibly be given it in a volume like this.

Diagnosis.—The diagnosis of insanity in child-life is sometimes very difficult. In acute mania or extreme exhibitions of melancholia it is not difficult to determine the character of the trouble. Hysterical extremes will sometimes have to be studied very carefully, for it is not always easy to discover whether a child is posing or really ill. The insanity of epilepsy can only be determined by the epileptic seizure. Children who have sudden change of disposition, and from mild and gentle children become irritable, vehement and stubborn, especially if of delicate organism, are to be watched. Their symptoms may indicate the oncoming of no ordinary ailment of child-life and may be pathognomonic of severe mental disease. Usually fears or apprehensions are deserving of reasonable consideration. If not belonging to mental derangement moral influences will generally restore confidence promptly, and thus remove the condition. If, on the other hand, they are in any wise dependent upon approaching derangement

It will be necessary that the symptoms be carefully noted and cured as promptly as possible. The eye affords the best index to the mental state of the child. Alternation of dilation and contraction of the pupils, symptoms of strabismus in association with mental perturbances in children who have previously been well, excited ocular expression, with injection of the blood vessels of the eye, all serve as indices as to what is going on within the brain. In acute brain disturbances resulting in the insanity of child-life the pulse is rapid and irritable, the skin hot and dry, the child thirsty, restless and apprehensive, and there are certain states of nervous excitability that are departures from the normal condition of the individual child, more easily recognized when seen than described. It is only in the most pronounced types of child insanity, when acute mania or the reverse appears, that prompt diagnosis can be made. It is generally necessary to watch the case for a considerable period of time and to weigh carefully all symptomatology before a correct diagnosis can be arrived at.

Prognosis.—The insanities of children are more amenable to treatment than those of adult life. Of the transitory psychoses acute mania, melancholia, chorea and hysterical insanities are responsive to proper medication and discipline. If chorea major be already well established the prognosis is doubtful, and in insanities depending upon epilepsies with syphilis as a basis it is also more grave. The phobias are quite certain to yield to correct medication, and even without treatment are overcome by the confidence that comes with years and proper training. Even severe types of dementia, especially if syphilis be their causative factor, eventually respond to specific treatment in many instances, although in a general way children so affected are not apt to be well balanced mentally. Melancholic subjects are more difficult of treatment than the more active manifestations of mental derangement, as delirium, high grades of excitement, and violent insanities.

Treatment.—The treatment of child-insanity will depend in good measure upon its cause. If due to syphilitic dyscrasia, as is often the case, it will be necessary to apply anti-syphilitic remedies. If due to cerebral growth of any nature it will be necessary to study carefully the diagnosis and administer treatment calculated to promote absorption of morbid structures. If of epileptic character it will be necessary to treat the epilepsy, and thus allay the irritation that is the cause of the mental disturbance. If of kidney origin medication will have to be directed to this gland, and proper constitutional diet instituted in order to overcome uremic symptoms. If due to sexual reflexes the practices of orificial surgery may have to be resorted to. Reflex insanity, or insanity due to sexual reflexes, as adherent prepuce or adherent clitoric hood, are not at all uncommon in children, and surgical attention to the genitalia will often promptly restore mental health. The moral

treatment of insane children is very difficult, and it is not possible in a volume like this to more than suggest firm, gentle, kindly discipline. Harsh measures should never be resorted to. Nurses or parents who are stern and fail to secure the confidence of a sick child but add to the trouble and create complications that are difficult to overcome. If at all possible insane children should be subjected to hospital treatment. It is as important that children who suffer from "a mind diseased" shall receive careful sick-room treatment and attention as though the lungs or other solid organ of the body were the seat of the disorder. It is necessary that insane children should be carefully watched lest they do themselves harm. If they are especially liable to violent outbursts these are more likely to result in injury to themselves than others. In the absence of hospital treatment it may become necessary to remove the child from its home to the home of a relative or friend of whom it is especially fond. The essential feature of moral treatment of insane children, as of insane adults, is the gaining of their confidence. When once this is lost it is better that altogether new attendants be secured.

The medication of insane children is not especially difficult. Remedies will be selected according to their well-known general indications.

Acowite.—In acute inflammatory types, in which the mania depends upon fever, there is no better remedy than *Acowite*. It has intense cerebral excitement, great nervousness and restlessness, hot, dry skin, and the wild delirium belonging to acute mania in association with almost any form of fever.

Belladonna is suited to the congestive types of brain trouble, with delirium and mania. Mania attended with convulsions; child exceedingly violent, with disposition to bite, and with foaming at the mouth and violent manifestations of rage.

Stramonium has mania with unusual manifestations of strength. Frightful fancies, such as horrible shapes and wild beasts. The child is violent because he believes those who are undertaking to restrain him are trying to do him harm. Dilation of the pupils with glistening, staring eyes, distorted features and outbursts of wild fury.

Polanilla is especially suitable in the melancholic form of insanity in young girls and timid subjects, who are disposed to be despondent and tearful and to brood over imaginary wrongs. Applicable in insanity of young girls with amenorrhœa or suppression of the menses.

Gelsemium is to be thought of in association with repelling of eruptions. Wild excitability, excruciating headache, strabismus, and sensation of numbness, tingling and crawling, as of insects. Suited to the convulsions of hydrophobia and to similar states in insane children. Expressions as to strange sensations in the head.

Excessive irritability of both body and mind, attended by confusion of thought and inability on the part of the child to explain his sufferings.

Hyoscyamus is adapted to insanity with lasciviousness, to insanity in children who are sensually inclined, to young boys and girls who are subjects of onanism followed by hallucinations and nympho-maniacal tendency.

Aurum metallicum is suited to the melancholic depressions of insanity. *Ignatia* is applicable to fear of being left alone. *Arsenicum* has periodic attacks of anguish and restlessness, with excessive fear. Fixed idea that the patient has offended everybody and cannot be happy. Is especially afraid of death and imagines that he is going to be killed.

Nuxvomica is called for in subjects of despondency who are restless and wander away from home. Children try to keep out of sight, cannot be relied upon, are vehement and vicious.

Cantharis has rage, with screaming, howling, biting and great sexual excitement. Paroxysms of rage upon the sight of water, or attempting to drink.

Besides these remedies, *Anacardium*, *Cuprum*, *Sulphur*, *Opium*, *Lachesis*, *Platinum*, *Passiflora*, *Veratrum*, *Coffea* and other remedies will be found useful in special cases.

The essential points to be taken into consideration in making the prescription are the cause of the mania, the character of the attack, and the condition of the mind following. Prescriptions based upon single symptoms will rarely be successful. The case must be taken into consideration in relationship to cause, symptoms and after results.

CHAPTER XXXVI.

HYDROCEPHALUS.

General Considerations—Menigeal Alliance—Chronic Hydrocephalus—Diagnosis—Morbid Anatomy—Symptoms and Course—Associate Defects—Treatment—Adjuncts—Medication.

General Considerations.—Hydrocephalus, or acute dropsy of the brain, occurs only in association with inflammation of the meninges. It belongs especially to tubercular meningitis. It is rare during the first year of life but more frequently seen between the second and fifth years. There is an excess of water or of fluids in the lateral ventricles, the result of intra-ventricular inflammation and excessive exudation from the vessels of the choroid plexus. In a majority of cases tuberculous disease is the base of

the trouble and upon investigation there will be found the history of former tuberculous disturbance of the bronchial or mesenteric glands. In rare cases it seems to be dependent upon primary inflammation of the membrane without previous evidence of tuberculous ill-health. In these subjects it is thought that perhaps the inflammation of the meninges is set up by the migration of bacilli from associated neighborhoods, as middle-ear disease, catarrhal affections of the cribriform plate of the ethmoid, and tubercular periostitis that has not yet been recognized. The meninges at the base of the brain are most involved, and it is this fact that gives to the acute form of hydrocephalus the name of basilar meningitis. It is a disease of comparative frequency and is seen especially in association with acute gastro-enteric diseases of children. It is also associated in later child-life with general tuberculosis. It seems to have an affinity for individual families, suggesting the thought of the influence of heredity. While the difference in its preference for sex is not well pronounced yet it is a fact that it is seen more commonly in boys.

It is also associated with certain of the eruptive disorders, especially measles and whooping-cough, other than scarlet fever and diphtheria. Sudden recession of eruptions is often attended by hydrocephalic symptoms, and especially are these attendant upon sudden suppression of diarrhea with the peculiar hydrocephalic cry as one of its most prominent symptoms.

Meningeal Alliance.—As may be inferred, this type of hydrocephalus is so closely allied to tubercular meningitis that the pathology, general course and symptoms, and the general management and treatment of the two conditions are practically the same. Some authors write of them as separate ailments, but acute hydrocephalus is so often dependent upon tubercular inflammation of the meninges that most authorities, especially the closest observers, discuss them in association. Hence, for further consideration of the subject the reader is referred to the chapter on tubercular meningitis.

Chronic Hydrocephalus.—Chronic hydrocephalus is one of the most pitiable of all the diseases of child-life. It is evidenced by an excessive accumulation of fluid in the ventricles of the brain. This may occur before birth, may follow acute meningitis, may arise without any apparent cause, though doubtless due to a tuberculous state of the meninges, or it may result upon abnormal growths, as, for instance, a tumor of the cerebellum which causes compression of the cerebral vessels and serous effusion within the cavities of the brain. A typical illustration of the hydrocephalic child is shown in Fig. 39. As will be observed, the child is thoroughly well nourished and is plump and as muscularly well developed as most children of its age. The enormous distension of the head, which will sometimes measure as high as from twenty-

four to thirty-two inches in circumference, and the peculiar facial expression are the characteristic objective symptoms of hydrocephalus.

The congenital form is rare, although children are born with dropsy of the brain, the head being so enormously large as to be delivered with difficulty even though the contents of the skull are largely fluid. These cases are doubtless due to degeneration of the blood vessels from rickets, syphilis, tuberculosis or other



FIG. 39.

constitutional cause. Syphilis doubtless plays the most important part in the congenital form of the disease, tuberculosis rivaling it in causative relation to the acute type. In perhaps a majority of cases the child is apparently healthy when born and no enlargement is noticed for some weeks, when, perhaps, with such constitutional disturbances as convulsions, febrile attacks and a tendency to stupidity it will be noticed that there is a growth of the head out of proportion to the balance of development. As the fluid accumulates within the skull the child's head enlarges, the bones being pressed outward, distending the fontanelles and sutures until the parietal bones are widely separated from each other and also from the frontal bone. The fontanelles are bulged and fluctuating, and because of the degree of pressure from within the cranial bones these may be indented with the fingers. The forehead is

bulging and hangs well out over the face, giving the child an abnormal appearance and putting the upper lids on such a stretch that the eyes appear distorted and protruded. The skin of the forehead and scalp is thin and shiny from being over-stretched, the cutaneous veins are flattened, and because the skin over them is so thin and stretched as to be transparent they show more prominently than is natural. The eyes project, divergent strabismus being often seen. In some cases the strabismus is convergent. The hydrocephalic infant is helpless, is not able to lift its head, and not always able to turn it from side to side. It lies in a condition of semi-imbecility, and as the case progresses there is almost if not quite total absence of intelligence. The limbs are generally paretic, the legs flexed upon the abdomen. Hydrocephalic children are objects of infinite pity. They may live to be several years of age with enormously distended heads and absolutely no intelligence. In some cases severe convulsions attend upon the condition, either from chronic meningitis or from the pressure of the accumulated fluids upon still healthy brain substance.

Diagnosis.—The diagnosis of water on the brain, as the condition is spoken of in domestic practice, is not difficult. The size of the child's head usually settles the question. If the accumulation is not great the hydrocephalic skull may be mistaken for the rickety skull or for an unusually ill-shapen and distended head. But as the head grows larger the diagnosis is more clear and the globular shape assumed from the accumulation of fluids within the skull, with the bulging fontanelles, widely separated sutures with fluctuations all along their course, but most pronouncedly at the fontanelles, determine the presence of fluid accumulation within the cranium. If the development of fluids is slow the hydrocephalic cry will assist in making the diagnosis clear. Care must be exercised not to charge up to hydrocephalus abnormality large heads that are not involved in any pathological process. Some children have very large heads, and if of rickety diathesis the head may be in shape so like the hydrocephalic head that the careless observer may be guilty of pronouncing a perfectly well child hydrocephalic.

MORPH ANATOMY.—The bones of the head are all thinned and made more elastic by the hydrocephalic process and are widely separated from each other. The vertical portion of the frontal bone is divided squarely in two by the separation of the frontal suture, which has a width of a quarter, or half an inch, or more. The sagittal suture is much wider and the parietal bones appear in extreme cases like bony islands surrounded by fluid. The frontal bone is projected forward so that it is pitched at an angle of five or ten degrees out over the eyebrows. The contour of the head is regular and the sides bulge so as to give the top a rather flattened

appearance. Not only is the forehead very much larger than it should be and the head distended in the bi-parietal axis, but the occipital region shows great enlargement. The ears seem to be well down upon the neck and the occiput extends backwards from the spinal axis for from one and a half to perhaps twice the ordinary measurement. There is not the degree of distension of the bones at the base of the cranium that there is at the cranial vault, and the spine is not often involved in the hydrocephalic process. In rare cases the effusion takes place in the spinal column for some distance. Such subjects are much more likely to have convulsions as a feature of their case.

If the hydrocephalic effusion occurs from the eruptive fevers or other disease of child-life after the cranial bones are united, the deformity of the head is not so observable. It is sufficient to cause profound systemic symptoms but not sufficient in quantity to force the bones apart by the separation of the sutures. The quantity of fluid secreted in chronic hydrocephalus is sometimes enormous, amounting to ten, fifteen or twenty pints or more in exaggerated cases. The fluid is clear or slightly turbid, is alkaline in reaction and contains albumen in proportion to the ratio of activity of the inflammation causing its effusion. The cavities of the brain are expanded by the presence of fluid in excess, in some cases the lateral ventricles and their horns being immensely dilated. The gray matter is flattened, the convolutions being entirely lost or moderately observable. The pons is flattened by the pressure of fluid in the fourth ventricle. The crura, corpora quadrigemina, optic thalamus, the optic tracts and the cerebellum are all flattened. In cases in which the quantity of fluid is excessive from cerebral tumor the stretching of the tentorium compresses the sinus at the base of the falx cerebri and checks the flow of blood in the veins of Galen. These return the blood from the choroid plexus and if they are compressed it is easy to understand how fluid accumulations occur in the ventricles. It is also likely that an excess of cerebro-spinal fluid is secreted and that the meninges assist in the production of the effusion.

Symptoms and Course.—The chronic form of hydrocephalus is slow in making its picture clear. It is not always that it is attended by positive symptoms in its earlier stages, and not unless a slight degree of enlargement of the head and separation of the cranial bones occur is it easily recognized. There may be prodromal symptoms of insignificant type, as peevishness, irritability, loss of appetite and slight feverishness. If the development of hydrocephalus follows closely upon whooping-cough or measles it is not difficult to trace the association of the two diseases. The child will not thoroughly recover from the specific affection, but will drag along for a few weeks or months in a variable state of health, not up to normal, the hydrocephalic condition coming on

gradually and presenting a continued picture, beginning with the acute infectious disorder. In other cases the symptoms may set in rather suddenly. A child who has been fairly well may develop a convulsion without appreciable cause, or headache, vomiting and fever may be seen in association with sudden manifestations of developing hydrocephalus. The headache may be intense; the child repeatedly put its hands to its head, utters pitiable moans and groans with perhaps occasional outbursts of the sharp hydrocephalic cry. Especially is the pain intense if hydrocephalus is in any way associated with middle-ear disease. It is not easy to explain the vomiting, which is sudden and sometimes persistent. In connection with acute gastro-intestinal disorders it is of the cerebral type; that is, the child will vomit forcibly, the contents of the stomach being ejected all over its bod or out on the floor. If the pain is severe the child may scream for hours continuously, only to become exhausted from its efforts. These symptoms are not often seen in connection with the development of chronic hydrocephalus, and yet it is occasionally ushered in in just this way, continuing from the acute manifestations described into the chronic hydrocephalic state, with copious cerebral effusion. In typical cases without acute exacerbation the child simply becomes more and more helpless, the head larger and larger, the expression more one of distortion and semi-imbecility, until finally the infant is unable to lift its head from the pillow. If it is old enough to walk when the disease-process begins its gait will be uncertain and unsteady and from day to day it will be less able to support itself on its feet. The mental condition of cases of this character is not very pronounced, usually. The child isn't as bright as its play-fellows, but it is not noticed that it is especially idiotic. In rare cases the head may become enormously enlarged and the cerebral effusion pronounced without any interference with the cerebral functions. There may be slight nervous manifestations, headache, moaning in sleep, and attention may be attracted to the child's head because of its continually placing its hands on various parts thereof; but there may be nothing more pronounced than these symptoms, besides, perhaps, a disinclination to play and an early fatigue upon efforts at play. The appetite is generally good and the digestion is not necessarily disturbed. It will be noticed by reference to the figure on page 361 that the bodily nourishment in this case is not impaired. I recall one case in practice in which the head measured twenty-six inches in circumference in a child four and a half years old, which was in possession of all his physical faculties and was fairly well balanced mentally. Another instance occurring in my practice was as far removed from that as possible. The child lay in perfect helplessness without showing more than passing evidences of intelligence, in a fair state of nourishment, simply living the life of a little animal for three years after the

symptoms began to develop. Ashby reports an illustration of a case six and a quarter years of age that had suffered from chronic hydrocephalus since three months old. The child was well nourished and its head measured thirty-one and a half inches. The legs were bent at the knee and flexed on the abdomen, but the spams of the muscles varied from time to time. The hands were kept closed and the elbows were flexed and more or less rigid. This child was a complete idiot.

While occasional cases of chronic hydrocephalus live a number of years and are thoroughly well nourished, the general result is a fatal one within a year or so. Infants born hydrocephalic generally succumb during the first year of life. They are slow in teething as a rule, though occasionally a case is seen in which there is no variation from the normal in the process of dentition. These subjects succumb to the summer complaints of children, and because tuberculosis is often the cause of the disease they die from pneumonia as well as bowel troubles. If there be no complication and if the subject of hydrocephalus be carried safely over the infant period it may live a number of years, death eventually resulting from gradually increased pressure of the accumulating fluid and more or less complete arrest of the cerebral function. These children become more and more idiotic and dull and eventually sink into confirmed coma, dying in a comatose state.

Associate Defects.—Hydrocephalus is often associated with other constitutional defects. Spina bifida is perhaps the most frequent of these and occurs in association with congenital hydrocephalus probably from an accumulation of fluid within the spinal canal, thus preventing the union of the lateral halves of the bony column. The association of hydrocephalus with various deformities, as bifid-spine, cleft-palate, hare-lip, web-fingers, joint deformities and contracted thorax is doubtless due to the constitutional predisposition in the individual child to these deformities mentioned, being in no wise dependent upon, but of common secondary relation with the hydrocephaloid state. These departures from the normal are usually associated with rickets or seen in rickety children.

Treatment.—The treatment of chronic hydrocephalus will largely depend upon its cause. If clearly traceable to syphilis it goes without saying that specific treatment will have to be instituted; that is, those remedies should be used that are especially applicable to the syphilitic state. If dependent upon rickets the general management and constitutional treatment of the rachitic habit will afford the basic treatment of hydrocephalus. If due to psora or to acute exanthematic fevers medication should be directed along this line of thought. If from traumatism, naturally *Arnica*, *Hypericum*, *Ledum* and other remedies that are found most beneficial in the treatment of constitutional conditions

following upon injury will be the remedies required, while in old school practice mercury and iodine are largely relied upon.

ADJUVANTS.—Some measure of success is claimed for compression of the head by means of strips of plaster or an elastic bandage. Ashby and Wright claim to have seen extensive sloughing of the scalp from compression of the scalp circulation between the skull and bandage and sensibly suggest that no real compression can be of service. A lightly applied elastic bandage may be of some use as a support, but no marked decrease of the fluid is to be hoped for from its application. The surgical treatment consists of puncture through the anterior fontanelle with a fine trocar, through which a considerable quantity of fluid may be withdrawn. This procedure is not unattended by danger, since if too much fluid is withdrawn convulsions and sudden death from collapse of brain substance may result. Not more than an ounce should be removed at a time, and since the fluid is rapid in accumulating it is doubtful if "tapping the brain" is ever justifiable.

If benefit is to be derived from treatment it will have to be directed according to the diathesis of the child and along the line of deep acting anti-psoric or anti-syphilitic medication.

MEDICATION.—*Sulphur* is perhaps the chief remedy because of its adaptability to so many constitutional dyscrasie. The child's skin is unhealthy and hangs flabbily; its bowels are usually deranged, it moans and groans and tosses as much as its feeble condition will allow; its stools are offensive and there is a peculiar penetrating odor from its body and breath; its parents, especially the mother, are of psoric habit. *Sulphur* is particularly applicable where the condition seems to have run through a family, that is, where hydrocephalus has occurred in more than one generation.

Iodine.—Next to *Sulphur* *Iodine* will most often form the basic treatment. It is especially adapted to glandular subjects and to children whose parents were rickety in childhood and who were subject to glandular indurations. *Iodine* more than *Sulphur* is applicable where tuberculosis is presumed to be the remote cause of hydrocephalus. Neither of these remedies is calculated to be of very great benefit in association with acute hydrocephalus, or with acute outbreaks occurring during the course of a chronic case. Here *Apis*, *Helleborus* and *Bryonia* are more frequently indicated.

Apis.—The *Apis* child is restless, rolls its head from side to side, or botes it in the pillow, uttering the piercing, hydrocephalic cry. Strabismus and spasms of individual muscles, especially the flexors, occur. The accumulation of fluid within the brain is rapid.

Helleborus is better suited to the apathetic state; the child botes its head backward into the pillow or lies motionless. In some cases this backward boring of the head is very pronounced;

with it the eyes are drawn upward and there are automatic motions of the leg and arm of one side, more especially the left. Pupils react slightly, if at all, to the light and the characteristic chewing motion of the mouth belonging to *Helleborus* and *Bryonia* is seen.

Bryonia, as suggested in considering tubercular meningitis, is especially applicable to effusions from the serous membranes and in dropsy of the brain is next in importance to *Lactum* in promoting absorption of effused fluid. The *Bryonia* subject lies motionless and stupid. Its bowels are torpid; it takes no notice of anything, and the effusions increase rapidly.

Psorinum is very like *Sulphur* in its effects upon the constitution, and may occasionally be found useful when the latter remedy fails.

Thaps is suited to cases of syrotic history in whom there is gushing, pouring diarrhea, this giving temporary relief to the brain symptoms because of the rapid alternation of accumulations of fluid within the cranium and the outpouring of liquid stools from the bowels.

If paralysis is a pronounced feature, the child lying perfectly helpless, unable to move its head or its limbs, *Zincum*, especially the acetate of zinc, may be helpful.

The *Iodide of Arsenicum*, *Kali hydriodicum*, *Proto-iodide of Mercury*, *Iodide of Calcareo* and *Iodide of Barytes* are all remedies to be thought of in chronic hydrocephalus, to be chosen according to the constitutional state and the individual symptoms, especial stress being laid upon the former.

It goes without saying that it will not do to promise too much in the treatment of chronic hydrocephalus. It is rare that beneficial results follow upon the use of any line of medication. These cases are generally hopeless because of the constitutional dyscrasia that is behind them. If dependent upon the eruptive fevers the constitutional remedies already named, with, perhaps, the *Calcareas*, afford us a good list to select from and favorable results may be promised in cases seen early. The most that can be done in established hydrocephalus is to relieve the violence of the symptoms when acute exacerbations occur. If these are convulsive in type the remedies that will be found most useful, in addition to those named, will be *Belladonna*, *Cicuta*, *Cuprum*, *Nuxvomica*, *Stramonium* and *Passiflora*, depending upon the individual symptomatology of each case.

The abject helplessness of a hydrocephalic child is distressing. Sometimes hydrocephalic children live along for months and even for years without manifesting the slightest degree of intelligence, simply feeding, breathing and sleeping. Their care becomes a burden and only when hungry do they arouse to any manifestation of voluntary action. They are generally ravenous, and though there be not the slightest possibility of permanently

improving their condition the most careful medical prescribing is demanded in order that what faint ray of hope there may be of relieving the pitiable state may be realized upon. These children are subject to the bowel disorders of the teething period and summer seasons, as are well children, and it will be found advantageous in meeting these conditions and other diseases to which they are liable to rely largely upon the basic remedy that is most nicely adapted to their constitutional state. There will not be found to be the same responsiveness on the part of the system to symptomatic prescribing as in unafflicted children. It is often necessary to institute a combination of constitutional and symptomatic medication in order to overcome in them ailments that quickly respond to direct medication in other children.

CHAPTER XXXVII.

CHOREA.

General Considerations—Pathology—Symptoms and Course—Duration—Diagnosis—Chorea Major—St. Vitus' Dance—Habit Spasm—Treatment—Nursing—Remedies.

General Considerations.—Chorea is a disease which occurs most commonly between the ages of six and fifteen years. It is seen in older subjects and also in children three or four years of age. It is characterized by irregular movements of the voluntary muscles, sometimes amounting to spasms, and in individual cases to paresis of the arm, and it is associated with various states of mental debility. In extreme types the gyrations are something marvelous to behold. St. Vitus' dance seems to run in association with rheumatism, or with children of rheumatic parents. It is more commonly seen in girls than in boys, and is especially likely to develop actively about the age of puberty. More than three times as many cases are seen in girls. Children who are subject to it are nervous and excitable, easily frightened, and often sufferers from unfavorable conditions of life and over-rapid development. Fright appears to be a very common exciting cause of chorea, and yet it is doubtful if even severe fright is capable of developing the choreic state in children not so predisposed. The relationship between rheumatism and chorea is now more generally recognized than formerly. English authors, especially, associate the two. This is probably because rheumatism is more common to England than to America, Germany and interior districts in Europe, in which the association is not so pronounced. Osler found that 15.5 per cent. of 554 cases observed had a history of

rheumatism in the family. In 88 cases 15.8 per cent. had a history of articular swelling, either acute or sub-acute. In 33 cases there were pains described as rheumatic in various parts of the body, but not associated with joint disease. The rheumatic manifestations may show themselves in the child prior to the development of chorea, or they may have belonged to the parents, no evidence presenting of rheumatism in the choreic subject. It should be borne in mind, however, that many children are sufferers from rheumatism without their condition being fully understood. Children are born with unobserved endocardial troubles; and many of the pains and aches of child-life that are not of sufficient severity to confine them to bed may be rheumatic. Rheumatoid states following upon acute fevers certainly predispose to chorea and other nervous disorders. Dementia, mania and aphasia, like chorea, are occasionally the results of long-continued drain upon the system during the existence of acute exanthemata. Choreic manifestations may also follow upon severe sufferings of individual organs, as, for instance, inflammation of the middle ear. It belongs to pericarditis, endocarditis, and is very frequently a reflex disturbance from sexual irritation, as adherent prepuce, unhooded clitoris, inflammation at the ostium vaginæ, contracted frenum, and other abnormalities and irritations of the sexual organs in children.

Chorea is often witnessed in young women during pregnancy and the children of these subjects are very apt to be choreic. Choreic children are frequently born, too, of mothers who have had unusual cares, anxieties, and griefs during pregnancy, while the choreic state seems to have certain direct relation to a number of nervous diseases, as neuralgia, migraine, paresis, epilepsy, and allied disorders. It is also held, with, perhaps, some degree of truth, that ocular defects may be the cause of chorea. Insufficiency of the ocular muscles, with extravagant disturbances of vision, results in the development of nervous disorders, among which chorea is named. De Schweinitz reaches the conclusion, after examining several hundred cases, that hypermetropia and hypermetropic astigmatism are common conditions in the eyes of choreic children, being found in about 77 per cent. of the cases; but he does not directly attribute the occurrence of chorea to the ocular disturbance. It is quite likely that choreic children present ocular defects, just as other defects are seen with this disease; but the conclusion now generally obtains that defective eyes are not often, if ever, a direct cause of this disorder.

Chorea is especially common in children during the scholastic age, and is most often seen in precocious children who are close students and who strive to excel in their school work. The forcing of a child in her studies is among the most common of exciting causes. Mental strain, as working for a hard examina-

tion at school, has often developed choreic disturbances, and especially is this likely to occur in children of high-strung, excitable, nervous disposition. Bright, intelligent, active-minded girls, ambitious to do well at school and stimulated by teachers, parents, and their own ambition to carry off honors, form a large proportion of the cases of chorea seen in private practice.

Pathology.—Embolism of the smaller blood vessels of the brain is found in chorea and has given rise to the embolic theory of causation, it being attributed to endocarditis, which is the most frequent lesion of chorea. The lining membrane of the heart shows involvement in almost every case of chorea, and it is this, perhaps, that has given rise to the association of the condition with rheumatism. No constant lesions have been found in the nervous system in acute chorea, though vascular changes, such as hyaline transformations, exudations of the leucocytes, minute hemorrhage, and thrombosis of the smaller arteries, have been described (Osler). The generally accepted view is that chorea is a functional brain disorder affecting the nerve cells controlling the motor apparatus, instability of nerve cells being dependent upon hyperemia, anemia, psychic influences, and nerve irritations, either central or peripheral in their origin. The greater predominance of the disease in girls, and its occurrence at a time when the intellect is rapidly developing, favor the suggestion that it is simply an expression of functional instability of the nervous centres. The microbic origin has been suggested recently, but nothing definite has been determined in this connection. Fatal cases show cultures of micrococci similar to those found in association with pneumonia and endocarditis. If the disease follows upon scarlet fever, rheumatism, gonorrhea, or other acute diseases micrococci peculiar to those diseases are likely to be present.

Symptoms and Course.—The initial symptoms of chorea as ordinarily seen are inability to control the movements of individual muscles, especially the flexors and extensors of the fingers and wrists, together with a want of precision in the movements of the hands. Choreic children drop things on the floor, being unable to deftly feed themselves. In undertaking to do needlework or otherwise occupy her hands and fingers the child will fumble and show clumsiness, with jerky, irregular character of movements of the fingers. It may be that only one hand is affected; sometimes both are equally involved. The child is fidgety and restless, unable to sit still, and shows emotional disturbances, as nervousness, crying spells and fright at night, prompting the suggestion of intestinal parasites. There may be headache and irritability before the nervous symptoms are manifested. In individual cases if the child is supported by the trunk the legs will dangle, and in walking the gait is a little irregular. Facial twitchings, blinking of the eyes, twitchings of the corners of the mouth, and other irregular and

unnatural facial movements are among the first symptoms to attract attention. The muscular movements and inco-ordination are much more pronounced in relation to the upper part of the body, the hands especially showing them. Queer grimaces and distortions of countenance are sometimes seen, with nervous shaking of the head or twisting of the neck, as though the collar were too tight or not comfortable. As the case progresses the gait becomes shambling and awkward, and the child is more clumsy in all its movements. In undertaking to stoop it will fall, and if the disease occurs in the younger years of life the child who has been walking fairly well will have to hold to the furniture to get about the room. Irregularity of respiration occurs in most cases, the speech becoming thickened and indistinct. Squinting of the eyes is almost constant in some cases, and within a few weeks from the first manifestations the choreic child may be wholly unable to get about or to dress or undress herself because of almost constant irregular clonic contractions of various muscles. If the patient is lying in bed she will lie still if not disturbed, but if interfered with the movements at once begin, the hands, face and trunk muscles being thrown into a state of irregular movements, even to clonic spasm. The tongue is protruded with a jerk and drawn back into the mouth quickly. The muscles of the head are contracted and relaxed alternately, so that the head is moved from side to side. The movements are quiet during sleep, but choreic children are restless and upon arousing from sound sleep at once begin their gyrations. In individual cases the irregularity of movement seems confined almost wholly to one side, partaking of the character of hemichorea. One arm and the opposite leg may be involved. The right side is usually first affected, the left side more permanently so. In about one-fourth of the cases the speech is affected, and in pronounced types local paralysis may remain after the severity of the attack has modified. In many cases there seems more of a muscular weakness than paresis. The loss of power is not great, the weakness being shown more by the dragging of a leg or limping, or by feebleness of grasp in the hand muscles. The disability of speech is more a defect of articulation than phonation, the child preferring not to make efforts in the direction of talking. The lips and tongue are also involved in the defect, and if the respiratory muscles are involved paroxysms of panting and hard expiration may occur. Choreic children usually become hysterical, and if set to crying are so beyond control of themselves as to be not able to stop even when desiring to do so. The same applies to laughter, so that in many instances there is a mixture of the symptoms of chorea and hysteria. Optic neuritis is present in slight degree in some cases, according to Gowers, but in the majority of cases there are no ophthalmoscopic changes. Headaches are frequently complained of, and

hyperæsthesia or anesthesia is commonly seen. The mental state is peculiar. The child is listless and dull of comprehension in extreme cases, or shows little disposition toward intelligent effort. It cries easily and in most cases is more or less dejected.

Dementia is oftener a result of chorea than is acute mania. The choreic insanien is more common about the age of puberty, and is attended by violent delirium and excitement, the attacks resembling paroxysms of mania. In these cases the choreic condition increases in intensity, the movements becoming more violent, the speech more difficult and the patient generally more emotional. When symptoms of mania are present in severity they are not different from those of acute mania in other cases. Some patients are destructive, even to homicide and suicide. They are exceedingly vicious and violent and are difficult of restraint. More often what appears to be mania is nothing more than a severe hysteriform attack. In the former there will be increased temperature and other physical symptoms of insanity. Talipes and wrist-drop are sometimes associated with choreic convulsions followed by paralysis. The gastro-intestinal system does not seem to be involved, further than that a moderate degree of dyspepsia is often present. Incontinence of urine is seen in young children, and in rare cases where fright is associated in the choreic subject involuntary action of the bowels may occur. The pupils are dilated, but irregular contractions of the iris are often present. Rapid heart action and disturbed rhythm are not especially peculiar to chorea, although occasionally present. In especially neurotic subjects the action of the heart may be exceedingly irregular and tumultuous and the patient may occasionally complain of pain about the heart. A hemic murmur may be heard at the apex of the heart, soft and blowing in quality upon auscultation; occasionally a systolic murmur is heard at the base.

Endocarditis is so often associated with chorea as rarely to be absent, but, as in rheumatism, it is not often suggested by the presence of symptoms. It should be hunted for in all choreic subjects. According to Osler, in thin, nervous children a soft systolic murmur may be heard at the base of the second left costal cartilage, but it is of no especial moment. A systolic murmur of greater intensity heard at the apex and along the left sternal region is not uncommon in anemic and feeble states, but does not necessarily indicate endocardial inflammation or valvular insufficiency. A murmur of maximum intensity heard at the apex, with roughness of quality and sound transmission to the axilla or angle of the scapula, indicates organic lesion of the mitral valve and is usually associated with enlargement of the heart. The endocarditis of chorea is almost invariably of the simple or warty form, and is not looked upon as dangerous; but it may lead to sclerotic changes in the valves which result in incompetency.

Pericarditis is also an occasional accompaniment of chorea, seen in association with pronounced rheumatic inflammation.

Pain is not generally associated with chorea, but in exceptional cases it will be experienced in the limbs as a marked symptom. Weir Mitchell has described these cases as painful choreas. Tingling and prickling sensations and numbness of the affected parts are often complained of, and occasionally there is pronounced anesthesia over considerable areas of integument. Spots of tenderness along the spinal column at the points of emergence of spinal nerves and along the course of nerves of the limb have been compared by French authors to the hysterogenic points in hysteria. In many cases the chief sensory disturbance is headache. I recall two cases in which headache was a very pronounced symptom. In one case it occurred before the development of chorea and lasted throughout several weeks of pronounced choreic movements. At no time during the existence of the chorea was the child freed of headache and sometimes it was so severe as to create the belief that a cerebral tumor was at the base of the trouble. The case eventually cleared under constitutional treatment, with final complete subsidence of all the symptoms.

Psychical disturbances of chorea are of so little importance. Many children are punished for willfulness, disobedience and perversity of temper in the initial stage of chorea. Children who behave oddly, are morose and despondent, or perhaps vehement and so irritable that it is impossible for their little play-fellows to get along with them, who are nervous, and in whom there are developing facial twitchings and perhaps irregular movements of the hands and arms, as though the clothing was constricted at the axilla, are oftentimes but subjects of mild manifestations of chorea, needing the attention of a physician rather than correction. While excitability is not the commonest symptom in the first stage it is very often present. In other cases the child shows mental abstraction, failing to concentrate its thoughts or ideas upon anything or to take any interest in games or books.

It is not often that there is an increase of temperature in chorea unless nervous manifestations come on quickly. If the case is ushered in with general malaise, irritability and peevishness, extending over a few days, there is likely to be an increase of temperature of a degree or a degree and a half, and perhaps daily manifestations of fever for a week or two. In association with rheumatic troubles, especially those of the joints, the temperature may be elevated to 102° or 103° or higher. In the maniacal form of chorea there is always increase of the temperature, and the range is sometimes as great as in other types of mania. In individual severe cases the constitutional affection is profound, and in association with fever, headache, excessive nervous irrit-

ability, loss of appetite and perhaps hysterical outbreaks, there may be various eruptions of the skin. Herpes, papular rashes, erythema nodosum, urticaria, and, in connection with rheumatism, peliosis rheumatica are present.

As seen in general practice, however, these severe types of chorea are not common. The ordinary nervous manifestation peculiar to incoordination of the muscles and nervo-muscular gyrations form the chief symptomatology of the disease. It will be diagnosed from multiple and diffuse sclerosis by the difference in the character of the muscular movements and the impaired intelligence; the fact that the latter comes on in infancy and the chronic course of the disease, together with the rigidity of the muscular system which is sometimes seen, clearing the differential diagnosis. From ataxia it will be differentiated by the slow incoördinate movements, the scoliosis, the early oncoming of talipes, the peculiar speech and the family character of the disease, it running through families in different generations.

Duration.—In very mild cases chorea is curable in two or three weeks. Severer cases may last as many months, and chorea major, or Frederick's ataxia, depending upon cerebral sclerosis, is more or less permanent throughout life. One of the worst cases I have ever seen was in a man thirty-two years of age who had been choreic since childhood. His contortions were something unusual while his intellect was unimpaired and his physical system well nourished. Even severe cases, which have lasted a long period of time, if cerebral sclerosis is not an associate, are recoverable under proper medication, and occasionally recover spontaneously. Children who have had choreic attacks in the earlier years of life are subject to recurrences from severe illnesses and as puberty approaches; especially is there likelihood of occurrence in case the choreic child is exposed to rheumatic fever. These recurring outbreaks are almost invariably associated with heart involvement, the latter being probably dependent upon the recurrence of the chorea, rather than in any wise the cause of the latter. Gowers recites a case in which chorea occurred nine times without history of rheumatism, and yet associated with mitral constrictions. Recovery is the rule in young subjects; the earlier the disease develops the more likely it is to respond to treatment. It is only occasionally that death occurs and when this result obtains it is due either to paralysis or cerebral sclerosis. The heart involvements of chorea are not likely to be severe, yet if chorea and rheumatism are associated permanent mitral impairment may result and death ensue in child-life from mitral insufficiency. The average duration of chorea is from three to six months. Under proper homoeopathic treatment it will be less, especially if the right hygienic measures and moral surveillance be instituted. It is much more likely to be longer where over-

anxiety and intense watchfulness are exhibited by the nurse and parents, the child being surrounded by such an overwhelming halo of nervous anxiety that its nervous system suffers through sympathy and the absence of proper moral hygiene.

Diagnosis.—Chorea is not likely to be mistaken for other nervous ailments of children. Multiple and diffuse cerebral sclerosis in unusual cases may be mistaken for it. Osler recites a case of chorea spastica, in which a child nine years of age when two years old had spasms recurring constantly for twenty-one days, these persisting occasionally with great severity for nine months. In the ninth year his speech was hesitating, he was unable to stand, sit, or feed himself, and could only use his muscles in an irregular, incoördinate way. In attempting to grasp an object the fingers were thrown out in a stiff, spasmodic manner the child being unable to close them over an object. The history of this case, with its severe convulsions in after life, and the failure of proper development at any time through life, would preclude the diagnosis of chorea as a distinct disease. Spastic children may have choreic movements, but there need be but little confusion in the diagnosis. The onset of spastica is sudden, the impaired intelligence, chronic course of the disease, and muscular rigidity forming quite a different history from the choreas of child years.

Chorea Major.—St. Vitus' dance is a name that has been applied to a peculiar pandemic chorea that occurs from epidemics of unusual excitement. It has been especially associated with outbreaks of religious fervor being characterized by great excitement, wild gesticulations and religious dancing, the name St. Vitus arising from the fact that pilgrimages were made for the relief of its symptoms to the chapel of St. Vitus, in Zebson, in the Rhenish provinces. Outbursts of pandemic chorea have occurred also in the United States during periods of special religious excitement. Pathologically this ailment is not chorea as the disease occurs in child-life, but is nothing more than violent hysterical manifestations of choreic symptoms. It is seen very often among the negroes of the far south. During revivals of religion they become highly excited and gesticulate in the most exaggerated fashion, throwing their limbs and swaying their bodies in all directions, falling upon the floor, and often going into trance-like states accompanied by pronounced coma vigil. This type of hysterical chorea is not often seen in children, yet it is met with in young girls, at or about the age of puberty, whose minds are especially preyed upon by religious emotions.

Habit-Spasm. or the choreic habit is seen in child-life, especially in young girls from seven to fourteen years of age. It consists especially in localized spasmodic movements with occasional outbursts of psychical symptoms. These habit-spasms con-

sist of jerkings or twitchings of certain of the facial muscles, as repeated winking or drawing of the mouth to one side, or perhaps the neck muscles are the seat of the spasms, which are shown in unilateral movements of the head. The sudden and repeated shrugging of the shoulders, as though the clothing were too tight about the shoulders and neck, believed to belong to chorea proper, relates to this form of chorea.

Belonging to the habit-spasm is the tic convulsif of the French, showing itself in the involuntary muscular movements which, in exaggerated cases, amount to irregular and violent movement of all the muscles of the body, together with explosive outbreaks occurring in association with violent throat and chest movements. In extreme cases the psychological feature of the case consists in profanity or insanity on the part of the child in connection with the choreic spasm. Osler recites a case of a child who constantly uttered the word "damn" when making the involuntary movements. Another type of this feature of chorea consists of greater mental disturbance, the patient becoming the subject of a fixed idea. In general this is not classed as a diseased condition. Peculiar actions are recited, as the tapping of the heel a certain number of times upon the bedstead; the rotating of a tumbler three or four times before drinking and repeating the same before setting it down; before opening a door a certain number of taps has to be given, and before brushing the hair a certain length of time has to be taken to count a supposed number of figures before beginning. This type of tic convulsif is called arithmomania, and is most common to young girls who have studied very hard at their arithmetic, and in whom degeneration of the nervous system is going on. In pronounced cases the individual actions spoken of or conduct similar to these will differentiate arithmomania from chorea proper. The name *croptolalia* has been applied to the type in which excessive disorders occur in conjunction with the choreic spasms. The prognosis of arithmomania is generally unfavorable. In one case occurring in my practice it has been for years a settled condition, the subject being now above thirty years of age with no signs of a fatal issue. In most other respects the young woman is enjoying good health, although she has been a sufferer from dysmenorrhea and other reflex neuroses since the age of puberty.

Treatment.—Choreic children are usually abnormally bright. One of the essential elements in treatment is to secure freedom from efforts at mental activity, and also to secure that degree of bodily rest that will result in freedom from muscular taxation. Whether attending school or engaged in kindergarten work or studying at home the choreic child should be immediately relieved of all intellectual efforts. If the muscular movements be pronounced, and especially if there be shambling gait and weak-

ness of the lower extremities, it should be insisted upon that the child is ill and that it be put to bed. No muscular movement is made without nervous effort and none that can be avoided is permissible in the choreic child. Only the simplest toys should be allowed, no excitement being permitted that can be avoided. Pleasantable excitement is as harmful as that which is distasteful. The object to be obtained is rest, with only passive efforts at intellectuality and muscular movement. The rest treatment is among the most successful in this and allied nervous diseases.

HYGIENE.—Choreic children should not be allowed to romp and play with children who are well. In attempting to keep up with their play-fellows they will engage too actively in games, with resulting muscular and nervous fatigue. The close association of rheumatism and chorea must be borne in mind and the choreic child dressed accordingly. No matter what the season of the year flannel should be worn next the skin and flannel night-wrappers be worn, encasing the entire form. Choreic children should not sleep in rooms on the ground floor nor in quarters that are close, stuffy and damp. A bright, sunny room, cheerfulness of attendance, simple but wholesome food, and warm, comfortable clothing form a hygiene that should be carefully practiced in every case of chorea, and without which medication will not accomplish its results promptly and satisfactorily.

The moral influences that surround the child should be those of cheerfulness and avoidance of anxiety. Careful, constant, cat-like watching of the choreic subject by a nervous mother will always be an infliction upon the child. Choreic children should be compelled to sleep alone. A frequent cause of choreic debility is the bed-fellowship of an older and stronger person with a delicately constituted, nervous child. One of the most harmful practices to children is their association with adults as bed-fellows, whether sick or well; and especially when the nervous system is debilitated is it harmful for them to occupy the same bed with adults or even older children. As suggested, it is better for the choreic child to sleep by itself. In suitable weather the choreic patient should have out-of-door air, moderate exercise, but never to excess, and if the case is pronounced and of the acute variety it is better to restrain the child in bed for two or three or four weeks until its recovery is assured than to tax it with efforts in the sunshine. It goes without saying that when this hospital-treatment is instituted the child's room should be bright and sunny and its surroundings as cheerful as possible.

Medication.—The remedies that will be found most useful in treatment of chorea as ordinarily seen are *Iguatia*, *Calcarea carbonica*, *Arsenicum*, *Nux. vomicata*, *Hyoscyamus*, *Gelsemium*, *Cimicifuga*, *Valeriana*, *Sulphur*, and *Psorinum*. Chorea so often depends upon an unexplained diathesis that its basic treatment

should be constitutional. If of rheumatic origin *Rhus tox*, *Cimicifuga*, *Colchicum*, and *Bryonia* are more especially to be thought of. If from repressed eruption of chronic character *Sulphur*, *Psorinum*, and *Thuja* will be demanded. If immediately following upon acute exanthemata *Gelsemium*, *Sulphur*, *Calcaria*, *Phosphorus*, *Rhus*, and, perhaps, *Caprum* may be required. If of undiscoverable origin the deep-acting antipsorics will form the best basic treatment. If due to repelled measles *Lycopodium* and *Calcaria* should be considered. *Kali carbonicum*, *Phosphorus*, *Bryonia*, and *Veratrum viride* will be needed if the choreic manifestations follow upon pneumonia. In every case the cause must be taken into consideration as nearly as possible.

Gelsemium is especially adapted to the case assuming a semi-paralytic form, where there is great muscular weakness, the arms dangling helplessly at the side, with gyrations of the head and neck; it is also especially applicable to cases following upon acute fevers.

Phosphorus.—Tuberculosis is probably the basis of the attack. The child is emaciated and scrawny; the intellect is feeble and the paralytic weakness is progressive. The child is always brightened and refreshed by sleep. (Worse after sleeping, *Lachesis*.) The child looks pale and sickly, with deep, hollow eyes and dark circles beneath them; its muscles are flabby, its gait ungainly, and there is great nervous weakness, with languor and debility.

Ignotus is especially suited to the chorea of young girls. There is tingling in the limbs, pains in the joints, excessive sensitiveness, with marked impressionability of the nervous system. Reflex irritation from the sexual organs; spinal irritation; spine tender to pressure, especially in the dorsal region. The child whines and frets and is of changeable mind; cannot bear to be contradicted and is obstinate and irritable. There is restlessness, moaning, with talking and twitching of the limbs during sleep. Upon being held by the body the child's limbs dangle helplessly.

Hecyranus.—Associated with choreic or hysterical symptoms, sudden spasms or convulsions come on with a shriek or sharp, shrill cry; attacks of frenzy and rage in choreic children who rave and scold at their playfellows and break out in crying spells, with exhaustion following; nervous, irritating cough occurring at night keeps the child from sleeping, resulting in excitation of choreic movements; exalted state of the nervous sensibilities, generally with incontinence of urine or retention of urine to an annoying degree.

Calcaria carbonica is especially useful for the correction of malnutrition, with resultant nervous disturbances. The choreic child presents the typical *Calcaria* picture—large head, distended abdomen, emaciation of the limbs, pale complexion; perspiration

about the head and neck at night; child melancholy, pale, and thin; either ravenous appetite or complete anorexia in association with nervous symptoms; irregular movements and shambling gait, without the positive gyrations of chorea major. *Calathea* is especially useful as a basic remedy, rather than for the individual choreic symptoms. It often assists in securing recovery where apparently well-indicated remedies are not prompt in producing their effects.

Cnicus has weakness and trembling in all of the limbs; unsteadiness of the limbs, especially in children; trembling paralytic weakness with fainting; children who have learned to walk fall easily, are clumsy in their gait, and their efforts at pedestrianism are shambling. Child is fretful and easily vexed; paralytic affection of the organs of speech, child unable to articulate because of excessive nervousness; indisposition to talk because of weakness of the muscles of the throat and of the tongue.

Chamomilla will be found especially beneficial in the nervous irritation of young children and in commencing choreic symptoms, manifested by an exalted state of the nervous system, with peevishness and irritation; constant nervous irritation, with intolerance of pain, twitching of the lips, facial muscles, eyes and lids; twitching upon falling asleep, with lameness and numbness of the limbs and disposition to keep them in constant motion.

Cina, and its alkaloid *Santonin*, will be found more beneficial in nightly disturbances of choreic children that simulate the symptoms of worms than for its general course and the muscular gyrations; child is restless at night; cries out startled; twitchings of the facial muscles and rolling of the eyes; threatened spasms in choreic children; wild nervousness and uncontrollability; chronic twitchings of the facial muscles, with drawing of the corners of mouth and continued picking at the nose, either from nervousness or bowel reflex.

Cuprum metallicum is indicated in choreic movements that start in the fingers and toes and spread to the muscles of the limbs; patients are quiet when asleep, but muscular movements are excessive during wakeful hours. Sensation as if choking or suffocating, making deglutition difficult; child grasps at its throat during nervous attacks.

Cimicifuga is especially adapted to chorea in association with muscular rheumatism; chorea of children approaching the age of puberty; chorea with muscular soreness, sensitiveness of the entire muscular system, sensitiveness of the spine and back of the neck; choreic movements of the arms and shoulders.

Ceanoth is to be thought of in connection with the spasms of choreic children; severe tonic spasms in association with acute chorea accompanied by fever. It is especially recommended by Allen, of New York, in the sixth dilution.

Sulphur affords the basic remedy in many cases of chorea of deep seated constitutional origin, with the characteristic *Sulphur* symptoms. Child is scrawny, skin unhealthy, constipation the rule, symptoms worse at night. When *Sulphur* fails *Psorinum* will often promote improvement. *Sulphur* and *Kali carbonicum*, as well as *Calcarea*, will have to be prescribed upon their constitutional indications rather than from particular nervous manifestations.

Arsenicum.—In old school practice *Arsenicum* forms the basis of treatment, being given for its supposed tonic effects. I have found it especially useful in the lower attenuations, sixth to twelfth, in chronic chorea following upon profound debilitated states of the system. Child generally debilitated; appetite variable; sleep disturbed; especially restless after midnight; nervous and apprehensive; very irregular action of the heart; face pale and anemic.

Coffea is applicable to chorea precipitated by fright, and will be found more useful than any other remedy in the nervous restlessness of children at night, and in the sudden frightened startings from sleep that are often seen in pronounced choreic cases.

Lubosis meets the same symptoms in more exaggerated degree. The child starts from sleep so frightened that it is not easily pacified. *Lubosis*, *Tarentula*, *Naja*, *Crotalus*, *Kali permanganum* and *Kali phosphoricum* are more especially to be studied in connection with a profound degree of nervous debility and long lasting choreic irritation.

Opium is suited to emotional chorea, the twitchings continuing during sleep. *Belladonna* may be called for in reflex chorea from dentition and in epidemic chorea. The motions of the body are generally backward or to and fro motions, with boring of the head into the pillow. *Crocea* has chorea occurring every seven days, hysterical in character, with contractions of single sets of muscles. The child jumps, dances, laughs, and is affectionate with everybody; is extremely happy, though sometimes disposed to rage. *Cypripedium* is also a remedy to be thought of in connection with paralytic chorea, with terrible contortions and awkward movements. Its mental symptoms are ecstasy and exaltation, or just the opposite, a melancholic desire to be alone. The contortions of *Cypripedium* are pronounced; the child is given to grimaces and fits of laughter. *Tarentula* is a remedy of importance in chorea major, with continual trembling of the whole body and cataleptic attacks in which the patient cannot speak, swallow, sit or stand or walk; must constantly lie down. There is painful rigidity of the muscles. All the symptoms of *Tarentula* are relieved by diversion, especially by music.

Rhus Tox.—*Rhus* will be found generally beneficial in chorea seen in association with rheumatism of recent date. The symp-

toms are all worse toward night, and there are muscular aching and muscular fatigue that are quite characteristic of this remedy. The symptoms of chorea are aggravated after every bath. The child dreads to be bathed. It is the muscular soreness and rheumatic pains, however, that specially call for *Rhus*.

Pulsatilla.—*Pulsatilla* is a basic remedy of some importance in chorea developing about the age of puberty, or when seen in association with delayed menstruation or mild disturbance of the menstrual function. The tendency is toward despondency and tearfulness.

Nux vomica.—*Nux* is better suited to spinal chorea, with unsteadiness of gait, dragging of the feet, and sensation or numbness in the affected muscles. The child is vehement and hard to manage.

Caulophyllum.—*Caulophyllum* is an excellent remedy for rheumatic chorea in young girls with menstrual difficulties. The rheumatic symptoms are pronounced about the small joints, and in these subjects there is severe dysmenorrhea of the neuralgic type.

Agaricus.—*Agaricus* is indicated in true cerebral chorea with jerking while sleeping and choreic spasms while awake. The muscles move spasmodically and the choreic movements are not confined to one side of the body but to an opposite upper and lower extremity, as the right arm and left leg or left arm and right leg. *Agaricus* has nictitation of the eyelids, with twitchings and spasms of the eyeballs. There is sensitiveness of the lumbar vertebrae, the spinal column being sensitive to pressure. As the disease progresses there is emaciation and an idiotic expression of the face. *Agaricus* is a king among remedies for true cerebral chorea.

Phosphoric acid.—*Phosphoric acid* is a remedy of value in chorea with great weakness and prostration as the characteristic condition.

Lilium tigrinum.—*Lilium* suits uterine and ovarian chorea with convulsive contractions of all the muscles of the body.

Other remedies that may be called for in special cases of chorea are *Zincum*, *Thuja*, *Sepia*, *Laurocerasus*, *Mygale*, *Bufo* and *Asafetida*.

It will not be found necessary to change remedies often in the treatment of chorea. If the properly selected basic remedy be exhibited occasionally it alone will suffice to cure, and to shorten the duration of many cases of chronic chorea. If individual symptoms call for special remedies these should be administered occasionally, only, and as urgently called for, reliance being placed upon the basic treatment. It is in its simplest manifestations alone that chorea is purely a local ailment. Established cases are engrafted upon constitutional dyscrasie, and to be successful treatment must be directed to the fountain head.

CHAPTER XXXVIII.

HYSTERIA.

General Considerations—Symptoms and Cause—Correlative Type—Non-Correlative Type—Diagnosis—Treatment.

General Considerations.—Hysteria is a functional nerve disturbance that occurs very commonly in the female sex from the earliest years of childhood to maturity. It is occasionally seen in older subjects also, and while not common to boys they are by no means exempt from it. It is most often seen in young girls about the age of puberty. The nerve disturbance takes on the form of sensory derangement, paresis, contractures, and even eclampsia. The disease, for such it really is, runs in families, and often seems to be transmitted from parent to child. It occurs in all races but is seen in its severer forms more especially among Southern-born people. In Europe it is most common to France and Italy. It is also more commonly observed among delicately-constituted children who are petted and pampered at home, whose food is highly stimulating and whose habits are those of emuls. Yet it is not limited to this class of children; as severe cases as I have ever seen have been met with in country practice in robust young girls. One of the worst cases I have witnessed among boys was in the person of a stout, robust cow-boy, who led an active outdoor life, and was as vigorous and strong as any of his fellows, though of delicate nervous organism.

Hysteria is not always a separate disease. It is more often seen in association with epilepsy, chorea, and organic brain disturbance. Its manifestations are not often apparent earlier than six or seven years of age, but after that time till the oncoming of manhood or womanhood, as the case may be, it is observed with frequency. It is much more common to children of bright, active minds, with enfeebled bodies, and those who are sentimentally inclined. In young girls love disappointments, grief, and undue pleasurable excitements often bring on hysteriform attacks. It may also be seen to occur from pain, severe suffering, and from mental worry, but is oftener met with in extreme pleasure and conditions that induce an over-wrought nervous tension. Girls given to onanism are easily impressed with hysterical spasms, and boys who are the subjects of masturbation are the more frequent sufferers of their sex. One of the worst cases of hysteria I ever saw occurred in a boy of six years who had got into the unfortunate habit of playing with himself. Upon receiving chastisement or rebuke he would become wildly hysterical and would be

guilty of the most extravagant habits and conduct. This form of nervous disease is so often associated with the sexual organs as to have derived its name from this association. In girls and women it is nearly always directly connected with the sexual system. Disappointment in love, ecstacy from supreme happiness in love affairs, exhaustion from sexual excesses, and disappointment in the sexual relation will often excite wild hysterical attacks.

Symptoms and Course.—Hysteria manifests itself in so many different varieties that it becomes necessary to divide it into various classifications. The chief clinical divisions are two, convulsive hysteria, and the non-convulsive type.

CONVULSIVE FORM.—This type causes the deepest concern, and is the most difficult of management. Its attacks usually follow emotional disturbances, the symptoms setting in suddenly, and consisting of exaggerated laughter or crying. This may happen while the child is at play, or may come on suddenly in the parlor in the presence of company, being usually the outcome of nervous excitement, induced by what is going on about the child. Generally preceding the attack there will be convulsive movements and a sensation of contraction about the neck as though a ball, which cannot be swallowed, was rising in the throat, the "globus hystericus" of the books. Commencing as simple inordinate laughter, or as convulsive sobbing which cannot be checked, the child becomes excited and violently hysterical, more or less unconscious of its conduct, and utterly unable to repress its emotions. From this inordinate laughter it may go into violent spasms of screaming or shrieking, soon followed by clonic convulsions during which the head is drawn backward so as to almost touch the shoulders, the whole body becoming so bowed that the feet are in apposition to the head, even. The limbs are thrashed against the bed, and the head may be jerked up and down so violently as to cause concern lest concussion of the brain result. The patient lies unconscious during the attack, but is not likely to injure herself, nor does she bite her tongue as in epilepsy. The hysterical paroxysm lasts but a few minutes when it slowly subsides, the patient giving way to profound emotion and gradually regaining consciousness. During the first part of the paroxysm the patient is usually conscious of what is taking place, being herself as the spasm progresses and having but indistinct if any recollection of what has happened. The nervous movements are more restricted to the upper part of the body, head, arms and trunk. The legs are not so apt to be involved in the spasm.

In individual cases hysterical spasms are very severe, the nerve shock profound, and the patient sinks in a torpid, semi-conscious state lasting over a period of several hours. It is closely allied to mild forms of insanity in rare cases, especially in girls about the age of puberty. The appetite is lost, and the subject

becomes so morbid as to constantly seek sympathy. She rejects all entreaties to take food, and wastes until considerably emaciated. Morbid consciousness is seen in this type of hysteria, and it so closely simulates a pure type of melancholia as sometimes to be differentiated with difficulty.

Hystero-epilepsy is a special type of the convulsive variety of general hysteria. It is preceded by minor hysterical manifestations, dyspeptic symptoms, irritation of the bladder, unusual conduct, and other prodromata. Symmetrical areas of hyperthæsia and hysterogenic spots are felt in this type of case. The convulsive hysteria already described has convulsions which may show in four different distinct stages. At first, the spasm closely resembles the true epileptic seizure, with tonicities of the muscles, grinding of the teeth, congestion of the face and neck, clonic convulsive movements following gradual relaxation and coma, the whole attack lasting longer than the epileptic fit. This is followed by emotional debility and the exhibition of contortions and cataplectic poses, which have been described by Charcot as clownish hysteria. The third group is that in which the patient assumes at once expressions of "ecstasy, fear, beatitude, or erotism."—(Osler.) Another group is seen in which the consciousness returns and manifestations of delirium and extraordinary hallucinations follow. The patient seems conscious and holds conversations with spiritual bodies or imaginary persons, relating with all the solemnity possible the certainty of her experiences. Among ignorant people, especially among the negroes of the South, this "heavenly vision" phase causes a great amount of religious excitement and fervor. Recurring hysterical convulsions are seen in this type of case, extending over a number of days, with a trance-like stage between, the patient occasionally rousing to consciousness and relating events that, to her, have transpired in faraway countries during the trance. These attacks are differentiated from epilepsy in the fact that they are not attended by fever, and the patient may go through a succession of spasms and trances over a number of days without material danger. Such a condition is not possible in epilepsy.

NON-CONVULSIVE TYPE.—In the non-convulsive type of hysteria among the most frequent disturbances seen are paralysis which set in abruptly or gradually and sometimes are not fully developed for weeks. It is very difficult to differentiate many of these forms from true paralyses. They occur as hemiplegia, paraplegia and monoplegia. About four times as many cases of hemiplegia occur on the left side as on the right. The face is not likely to be affected, although the neck may be involved, the lower limbs suffer most. A mild form of hysterical paraplegia is also seen, this being usually limited to the lower extremities. The power of the legs is not altogether lost, but hysterical paraplegic patients cannot stand upon their feet and many of the

symptoms of genuine paraplegia are associated in the attack. The knee jerk may be mild, and a spurious clonus of the ankle be seen. The feet are generally extended inward. The muscles do not waste as in true paraplegia, and instead of the nervous injury of the latter being attended by symptoms alone ascribable to the lower extremities there is likely to be aphonia and bladder irritation in hysterical subjects. Individual paralytic conditions may be seen in the facial, crural and brachial glands, and in some respects this type of case may closely simulate locomotor ataxia. It is well to suggest that this phase of hysteria is more commonly seen in adults than in children, but is not at all infrequent in girls approaching womanhood.

Besides paralytic simulations there are contractures and spasms belonging to hysteria of the non-convulsive variety that involve individual muscles or sets of muscles almost anywhere. These usually come on suddenly, but if the child is gradually developing into a confirmed state of hysteria contractures may be very gradual in their progress. They may be on one side or both sides. The wrist, elbow, or fingers may be in a state of rigid contraction and the feet, toes, and ankles may be the seat of spasm. In other cases special muscles of the hip, shoulder, or neck are drawn and rigid and hysterical trismus or hysterical cramp of the tongue is seen. In some cases the diaphragm and abdominal muscles are involved in hysterical spasm; in young married women the condition is often mistaken for pregnancy or tumor growths. In young girls the latter are likely to be suspected. Only anesthesia, which secures complete relaxation of the muscular system, will clear up the diagnosis. Phantom tumors and these spasms of the abdominal and diaphragmatic muscles are peculiar, though not infrequent in surgical practice.

Besides contractures there are clonic spasms of individual muscles that are very annoying and persistent. Rhythmic movements of the head or of the muscles of the jaw, and even of the muscles of the arm, are quite common; spasm of the psoas muscle may result in a regular rhythmic movement of the leg several times a minute; if the trunk is affected the sabbam convulsion or constant bowing movement of the body forms a peculiar phase. In some cases these clonic spasms amount only to a general tremor, more commonly involving the hands and arms. Volitional or intentional tremor may exist, simulating closely the movements of insular sclerosis. According to Bozard the latter very often is mistaken for hysteria in young girls.

In addition to the paralyzes and spasms of the non-convulsive variety of hysteria there are disorders of sensation in special cases which are very pronounced. Anesthesia and hyperesthesia of the whole body or parts of the body are very common. These may follow or precede hysterical attacks or may be present

throughout the whole course of the disease. In some cases anesthesia is so pronounced that the patient will bear pinching and pricking with pins without complaint, while in other instances the opposite state is so emphatic that the slightest degree of injury causes intense suffering. These patients are subjects of severe neuralgia and constitute the complaining type of hysterical subjects who are such an abomination in medical practice. But it should be borne in mind that individuals who are suffering the hyperesthetic form of non-convulsive hysteria are real sufferers, and it is not always just to undertake to estimate the degree of suffering by the extent of injury or the ordinary constitutional evidences of pain. They suffer in their minds and this is enough.

In addition to these disturbances of the sensory system there are permanent disturbances of special senses. Unusual acuteness of olfaction or exquisite sensitiveness of the retina to bright light may make the patient miserable. In olfactive types profound cerebral impressions are often made by disgusting odors, and by delightful perfumes as well. Subjects of hyperesthesia of the olfactive sense are sometimes rendered very unhappy because of the belief that offensive odors emanate from themselves, as from the teeth, breath, genitalia, or entire body.

Certain visceral manifestations occur in hysterical subjects that are deserving of consideration. Among these hysterical dyspnea and irregular, catching breathing, hysterical aphonia, hysterical hicough and various mimic cries may be named; hysterical whooping-cough is a very common ailment among young girls; that is, upon talking or laughing to excess, in fact, under any circumstances exciting cough, the peculiar crowing, barking, explosive cough of pertussis is heard. This hysterical cough is a very frequent symptom. It sometimes occurs in spasms and at other times in single explosions. It is much more commonly met about the age of puberty, belonging to both sexes. Hysterical aphonia is also common to both boys and girls, although more often seen in the latter. There is also occasionally present hysterical blood-spitting, described by Wagner as the expectoration of a sputum of a pale-red fluid, not so bright in color as ordinary hemoptysis and showing a brownish red sediment upon settling. I have never met with a case that I have felt sure was of this character. It is quite likely, however, that it may be confused with the vicarious menstruation of young girls which occurs from the lungs.

The digestive system is disturbed much more commonly than the respiratory by hysterical symptoms. Enormous accumulations of gas are sometimes attendant upon attacks of hysteria. Nausea and vomiting, anorexia, spitting of food and sometimes hysterical diarrhea are witnessed. In extreme cases of anorexia the patient may go for days or even weeks with hardly enough food to sustain

life. Many cases of this phase of hysteria belong to the general hysterical character, the anorexia being more a matter of self will than of genuine loathing of food. The patient is determined not to eat and may abstain from food until emaciation is pronounced. Cases are recorded in which death has occurred from voluntary abstinence from food until emaciation and exhaustion were something frightful to behold, without pathological lesions being discovered post-mortem. Constipation is more commonly seen than diarrhea in hysterical subjects, but the most annoying and prevalent feature in intestinal irregularity is the large accumulation of gases. This is so great that in special cases the deformity of the abdomen is enormous, and the tumultuousness that is going on within is exceedingly annoying and disgusting.

The heart suffers all sorts of functional disturbances in association with hysteria, from extreme abnormal slowness of the pulse to the most violent palpitation and irregular fluttering. In some cases the heart will beat violently for days in succession, until the patient is worn out from rapid and tumultuous heart action and the annoyances incident thereto. In other cases the pulse will sink until it is scarcely perceptible and its beat is so slow that it would seem as though life were certain to be extinguished. Cold sweats and hot flashes are seen in association with cardio-vascular disturbances, and, if unusually long continued, regular fibrillies occur, ending in prolonged trance; hemorrhage into the skin closely simulating purpura hemorrhagica has also been observed.

Hysterical fever, hysterical joint-affections, pseudo-rheumatic inflammations, exalted states of the sensibilities, physical and mental exaggerations, and extravagant ideas, even to monomania, in fact, all sorts of deviations from the normal in physical, mental and psychical states are seen in hysterical children and hysterical adults. Among the most peculiar and inexplicable conditions that are described, of which I have seen one remarkable case, is hysterical hyper-pyrexia in which the temperature registered from 112° to 120° and higher. A case occurred in Memphis a few years ago in which the bodily temperature was said to register 180° and which attracted a great deal of attention at the time. There was an attempt to explain this as a case of cerebro-spinal fever, and also as thermal fever, but the subsequent condition of the patient seemed rather to establish the fact that this most remarkable temperature range belonged wholly to hysteria.

Diagnosis.—The diagnosis of hysteria is sometimes very difficult, but in general it is comparatively easy to differentiate it from other disordered states of the nervous system. It should be borne in mind that there are not many symptoms common to epilepsy seen in association in hysterical subjects, nor does its symptomatology point to the convulsion of cerebro-spinal meningitis or

other established types of brain affection. The cause of the attack, the general health of the patient, her nervous temperament, the family history, in which the neurotic disposition predominates, are sure to point to hysteria. The contractures may be deceptive, but if uncertainty exists in regard to their causation anesthesia will clear up the doubt. Furthermore, there will be found in association with contraction of the individual muscles disturbances of the visual power and a general hysterical state. Older subjects who are more experienced, as hysterical women, will sometimes give the doctor a merry chase, practicing deception upon him at every turn until he may be quite bewildered; but with children there is much less difficulty in making the diagnosis, and reasonable care on the part of the practitioner is all that is necessary to a proper understanding of the nervous condition.

It is not always safe to rely upon threats of chastisement for the purpose of diagnosing hysteria in young subjects. In individual cases these patients will bear a wonderful amount of punishment rather than allow their deception to be discovered, and, furthermore, it should be borne in mind that in most children there is the natural dread of further chastisement if it becomes known that they have been practicing deception, and for this reason they will persevere in their hypocrisy. If a child is subject to recurring convulsions and the testimony is strongly in favor of hysteria the diagnosis may be cleared by a plunge bath or by deluging the patient with cold water. Quiet preparations at heating an iron rod to a white heat with the expressed intention of testing its virtues upon the hysterical spine will occasionally arouse the hysterical subject from her coma, convulsion or trance. In individual instances it may even be necessary to bring the hot iron close to the skin to convince the child that the physician is in earnest in his efforts to diagnose the case.

Treatment.—The treatment of hysteria will depend in large measure upon moral influences. Remedies will have to be directed toward the removal of the cause. In so many instances is hysteria due to pre-natal causes that it is impossible to get at these promptly with medication. Here it will be necessary to continue the properly indicated remedy over a long period of time during early life, with the idea of uprooting whatever of congenital disposition there may be to instability of the nerve centres. The earlier such treatment is instituted, and the more faithfully it is persisted in the more certainly will the patient derive benefit therefrom. During the course of continued medication it will be necessary that the various functions of the body are looked after. Constipation is one of the most inveterate of these, and is often the result of indifference or carelessness on the part of the patient, who doesn't take the pains to look after her functions as she should. Hysterical children of from six to ten years not infrequently suffer

great inconvenience and many accidents in this respect. The bladder, too, requires attention. Retention of urine from carelessness or indifference, with eventual incontinence, is of common occurrence.

The moral atmosphere surrounding hysterical children should be of the very best. If disposed to brood or become despondent and to seek solitude and remain undisturbed they should be gradually brought to engage in the games of child-life and, without apparent effort at entertaining them, it should be seen that their minds are constantly diverted from themselves, and that a happy, buoyant, cheerful disposition is cultivated. In hysteria, as with chorea, over-anxiety on the part of the parent, of which the child is conscious, but increases the trouble. An outside happy-go-lucky men, with pleasurable entertainment, plenty of outdoor exercise, well-ventilated sleeping apartment, simple, nutritious food and strict observance of well-known laws of hygiene and health are rigorously demanded in the treatment of hysteria in young people. It is sometimes necessary to isolate hysterical subjects and to insist upon bodily and mental rest. If it be clearly apparent that the nervous system is below par sick-room treatment is often demanded. In other cases change of climate, as to the sea shore or mountains, may be required. While it is true that hysteria is a mental disorder it is so often existent upon an unstable condition of the nervous system, due to lack of proper nerve nutrition, that it is no longer justifiable to treat hysterical subjects with disdain and contempt. Hysterical children are sick children, and must be treated as such; but, on the other hand, it is not wise to encourage their morbid moods nor pamper them in their disposition to nurse their own ailments. Gentle, firmness and moral restraint is necessary, and without this medical efforts will often go for naught. It is essential in cases tending toward confirmed hysteria to isolate them completely from their friends, especially from an object of undue affection, whether parent, brother, sister or play-fellow. Likewise it is necessary to exercise discriminating care in regard to the mental habits of the hysterical child. Over-close attention to books and excesses of all kinds that are taxing upon the nervous system must be avoided. Even pleasure can be easily carried to excess, and in no type of disturbed nervous function is it more necessary to caution against excess of all kinds than in hysteria.

MEDICATION.—The medical treatment of hysteria, besides the exhibition of the constitutional remedies on the lines already mentioned, will consist of the application of the well-selected homeopathic remedy chosen according to the individual indications of the case.

For an especially exalted state of the nervous system, with tendency to convulsions, *Ignatia*, *Nux. vomica*, *Chamomilla*, *Pate-*

riana, *Nux vomica*, *Moschus*, *Cocculus*, *Zincum* and *Belladonna* will be required.

For the constitutional state predisposing to hysteria we will have to look to *Sulphur*, *Arsenicum*, *Porrium*, *Silicia*, *Iodum*, *Lycopodium*, and *Thuja*.

For special hallucinations *Hypocistis*, *Stramonium*, *Cofea*, *Zincum*, *Aurum*, *Pulsatilla*, *Phosphorus*, *Staphisagria* and *Phosphoric acid* will be needed.

Asafetida, *Castoreum*, *Platina*, *Tarentula* and *Zincum calcatrum* will also be found useful in bringing relief to individual unpleasant sensations and persisting symptoms.

Ignatia.—The patient is distressed with anguish, shrieks for help and suffers with suffocating constriction of the throat. The child is sensitive to external impressions, laughs and cries alternately, face flushes on emotion. Spasmodic laughter ends in screaming with globus hystericus, flatulent conditions, contractions of the muscles and tendons of the feet, followed by an enormous quantity of limpid urine. This latter symptom is especially characteristic of *Ignatia*.

Nux vomica is not so likely to be useful in hysteria as *Nux vomica*, but may be required for violent opisthotonic, strychnia-like convulsions. Its mental state is one of despondency and moroseness alternated with irritability and vehemence.

Nux vomica.—The mental symptoms of *Nux vomica* change more suddenly and frequently than those of *Nux vomica*, and are of a milder type, it lacking the vehemence and malicious perverseness of the latter. With *Nux vomica* there is excessive tendency to laughter, hysterical attacks with faintness and an irresistible desire to sleep. The patient can be aroused with great difficulty; hysteric flatulence and enormous distention of the abdomen even after a slight meal. In young girls vicarious discharges takes the place of the normal menstruation.

Asafetida has more distinctly the sensation of a ball rising from the stomach to the throat than any other remedy. The *Asafetida* case suffers from this choking sensation and great repression of the breath followed by eructations of enormous quantities of gas, which relieve the repression. Frequent swallowing and empty gulping because of the spasmodic constriction of the esophagus belong to globus hystericus.

Moschus is closely allied to *Ignatia* and *Asafetida* in hysteria. The patient faints from the least excitement. The spasm is ushered in by constrictive feeling about the throat; rising as of a ball from the solar region to the throat; constricting spasms of the chest and alternate crying and wild laughing; great anguish in association with hysterical attacks, as if the patient were dying. Great vehemence of temper characterizes *Moschus*, the patient

being an inveterate scold, scolding until she faints from her own vehemence and suppressed anger.

Castoreum is lauded as a remedy for nervous, irritable children who live along the border line of hysteria. It lacks the violence of *Moschus*, *Ignatia* and *Asafetida*, and is perhaps better suited to the mild hysteria of children than the more pronounced remedies.

Platina is characterized by self-exaltation and contempt for others, a symptom not infrequently seen in the hysteria of precocious girls. Spasms with choking as menses come on, the flow being dark, thick and excessive.

Cocculus is another remedy presenting the choking constriction in the upper part of the fauces with difficulty in breathing and disposition to cough because of the constriction. *Cocculus* is suited to young girls in whom the menses are retarded or appear late and who are subject to fainting spells during menstruation, with temporary loss of consciousness and symptoms simulating paralysis.

Zincum is applicable in hysteria in the nervous subject who finds it impossible to keep her feet still; who moves them incessantly while sitting or lying; thrashing of the feet and limbs about the bed or nervous jactitations of the muscles of the lower extremities. Sharply defined *Zincum* convulsions are occasionally seen in these subjects, when more than ever will this remedy be called for.

Gelsemium is suited to hysterical epilepsy, convulsions with spasms of the glottis followed by stupor, languor and physical prostration; hysterical attacks in young girls who are subjects of nervous headaches that commence in the cervical portion of the spine and spread over the whole head; the epileptiform spasms in association with dysmenorrhea, the head being drawn backward on the shoulders and the patient left so languid and debilitated as to be days in recovering.

Belladonna suits a more violent type of hysterical convulsion. There is a rush of blood to the head, violent spasmodic attacks, intense redness of the face and injection of the eyes with dryness and constriction of the throat. The constriction is not like the globus hystericus, the patient being unable to swallow because of the constriction of the muscles and not because the throat seems choked with a lump.

Palmitilla is suited to the weeping hysterics of timid young girls and boys who are easily disturbed by fear and in whom gastric symptoms predominate. In girls the menstruation is delayed and scanty.

Valeriana, *Tarentula*, *Lachesis*, *Caulophyllum*, *Sulphur*, *Chamææilla* and other remedies will be thought of in individual cases of hysteria. For the special hallucinations that sometimes accompany hysterical attacks *Hyoscyamus*, *Stramonium*, *Coffea* and other remedies already mentioned will be required.

Silicæ is among the best of the constitutional remedies in pale, delicate subjects predisposing to or showing family history of phthisis. It corresponds to the "scrofulous" diathesis and its action is deep and long lasting. For the headaches of delicate girls commencing at the nape of the neck and extending up over the vertex to the frontal region it is especially adapted. Hysteria arising from over study or other severe tax upon the nervous system will often be met by *Silicæ*.

Calcarea phosphorica is also to be thought of in this connection. The complexion of the *Calcarea* child is waxy, or almost of a greenish-white hue. The menses are too early and profuse, resulting in chlorosis, hysteria following because of the debility of the system therefrom.

Staphisagria will be required by the patient in whom the memory is weak, the nervous system is worn out and exhausted, the patient pale, the eyes sunken and surrounded by dark rings; child moody and depressed.

CHAPTER XXXIX.

CEREBRAL PARALYSIS.

General Considerations—Symptomatology—Prognosis—Treatment—Adjuncts—Remedies.

General Considerations.—Lesions may exist in the membranes of the brain in the cortical centers of the pyramidal tracts of either hemisphere, being located as a rule in the cortical region. Paralysis from such lesions occur constantly in children with convulsions, fever, and delirium. The paralysis is much more likely to be hemiplegic than paraplegic. The reflexes are greatly exaggerated and the paralyzed limb is quite likely to be rigid. The muscular system is well nourished and there is not likely to be extreme wasting of the affected side. This kind of paralysis may be differentiated from polio-myelitis by the flaccidity and paresis of the latter with diminution of the reflexes and rapid atrophy that is resultant upon this form of cord diseases. In cerebral paralysis the electrical reflexes are all normal while in the paralysis of myelitis they are greatly diminished.

This form of paralysis occurs in the earlier years of child-life. It occasionally follows upon severe labor in which there has been injury from the use of instruments. It also belongs to cerebral tumors, and about one-half of the cases occur from convulsions which are the result of dentition and the infective fevers of childhood.

Symptomatology.—The symptomatology of cerebral paralysis may be classified into paralysis, reflexes, contractures, athetosis, post-paralytic, chorea, epilepsy, and mental defects.

Occasionally the first symptom noticed is the paralysis of an arm or leg, which cannot be moved at will. If the onset is sudden there will almost invariably be one-sided paralysis in association with or immediately following pain or convulsions. The convulsion is attended by loss of consciousness, which may last a few hours or for several days. Delirium and the usual symptoms belonging to severe cerebral disturbance are seen, and prior to the occurrence of the paralysis the head will be drawn backward, persistent rigidity of the convulsed portion of the system being observed. As the spasm passes off the child regains consciousness, when it will be noticed that only one side is paralyzed, more often the left. It occasionally happens that entire paralysis is seen where a number of convulsions have occurred, though the leg is not nearly so likely to be permanently affected as the arm. Moreover, the leg not only regains its power much more quickly but it does not show the emaciation or atrophy that is seen in the arm. If permanently affected there may be a slight lameness only, while the arm seldom regains full strength, showing considerable atrophy and wasting; this may be limited to the hand, the forearm remaining well developed and other paralyses being quickly overcome. Cases are occasionally seen in which the leg and arm are permanently impaired and in which they atrophy alike, but as a rule the recovery of the leg is quite complete.

The reflexes at the knee are often exaggerated, and the wrist reflex is also increased. If paraplegia should follow upon the convulsion the rigidity of the muscles may be so severe that it will be impossible to obtain the knee jerk in any considerable degree.

In perhaps half the cases there is a certain noticeable degree of rigidity and contracture of the paralyzed part. This is never seen in the face but is witnessed all too often in the arm and hand, and there is fixation of the shoulder, flexion of the elbow, both pronation and flexion of the wrist, and complete flexion of the fingers. If the leg is affected in contracture the heel is elevated, the extensors and flexures are rigid and the foot is inverted, the deformity developing itself into talipes equino-varus.

Athetoid movements while not common in cerebral paralysis are occasionally seen. They are more often witnessed in connection with the arm and hand, the movements being slight and regularly rhythmic, constant during waking hours and increased by efforts at voluntary motion. In severe cases there may also be athetoid movements of the toes kept up during sleep.

Post-paralytic chorea is seen in cases in which a partial paralysis occurs, being most often witnessed as the paralysis

improves. The choreic spasms become established as the power of motion of the paralyzed limb is regained. The movements are more exaggerated than are seen in hypertrophic tremor and are increased by involuntary efforts just as are the athetoid movements already described. In pronounced cases there may be choreic movements of the leg, arm and head at the same time, though generally the condition is not so pronounced as this, but a single member being involved in the process.

Epilepsy as seen in association with cerebral paralysis is not very different from the regulation seizures of this disease. The attacks generally come on with the hemiplegia and are more common to this form of infantile paralysis than to the hemiplegia of adults. The fits are not likely to be general but are limited to the affected side, in this respect differing from the fully developed epileptic spasm.

The aura of epilepsy is present in these convulsions and may be associately experienced on the paralyzed side of the body. Mental deficiencies of all degrees, from mere functional disturbances to confirmed idiocy, are associated with cerebral paralysis. Misshapen cranium, highly arched palate, and defective teeth go with the lesion, which would thus seem to depend in good part upon a lack of proper pre-natal development, or fetal malnutrition. The disease is due either to vascular occlusion

or to involvement of the gray matter of the cortex. Thrombosis may occur in the sclerosis of children, and convulsions and hemiplegia result. Endocarditis is doubtless responsible for the plugging of the blood-vessels in most cases. According to Gowers the lesions may belong to a surface vein and thrombosis occurring in the brain result in congestion, extravasation and punctiform softening, or a clot may form over a return vein of the pia mater, inducing depression of the cortex and interfering with its perfect development. The lesion consists eventually of atrophy and sclerosis, oftener in the motor area, though sensory areas may be involved when imbecility



FIG. 40.



FIG. 41.



FIG. 42.



FIG. 43.

blindness and deafness are seen if the convolutions about the sylvian fissure are the seat of the trouble. The theory offered by Strumpel is that an acute inflammation of the entire area of the cortex may occur, when the condition of polio-encephalitis is analogous to polio-myelitis.

Prognosis.—Complete recovery from infantile hemiplegia rarely occurs. The leg may wholly regain its usefulness or be but slightly affected permanently. The facial paralysis is overcome early, and is sometimes hardly noticeable even in the pronounced stages of paralysis. It is generally limited to the lower part of the face, the frontalis and orbicularis palpebrarum rarely being affected. The arm, however, is not so fortunate, being generally permanently paralyzed. As already suggested the shoulders and upper arm may quite regain their strength, mobility and contour, but the forearm and hand nearly always remain paralyzed and more or less contracted, and in most cases the contracture and rigidity are so pronounced that the paralyzed parts are rendered useless. In other cases more or less completely paralyzed the contracture will be less pronounced.

Treatment.—In addition to the indicated remedy it is necessary in treating the convulsions, if they are unusually severe, to resort to anesthesia. Sedatives are harmful in the fact that they contract the blood vessels and prevent the absorption and removal of the blood which has escaped from ruptured vessels and reduction of the clot to the smallest possible size.

ANURVANTS.—If the affected side be hot the child may be incased in a cold pack, cold applications being placed to the head, remembering that ice is more likely to prove harmful than beneficial. If the paralyzed part is benumbed and cold the child should be wrapped in a blanket and equilibrium of temperature be retained in so far as is possible. Massage and electricity may be used to overcome contractures and both may be practiced with relation to paralysis, though it is not likely that either faradization or galvanization will do more than keep up the nutrition of the affected parts, since the origin of the paralysis is central. Massage and electricity, especially faradization, applied persistently to the leg seem often to assist in restoring the ability to walk. Orthopedic appliances may also be helpful in this relation.

Medication.—The application of remedies to cerebral paralysis does not promise especially good results. Coming on suddenly as mere rupture of the blood vessels and from effused blood and blood-clot *Arnica* and *Hypericum* will be most useful. *Arnica*, especially, may be continued over a considerable period of time with almost certain earlier restoration of the limb and more complete recovery of the arm than would otherwise occur. *Cypripedium* and *Zincum* are also to be thought of in connection with this derangement of the

nervous system. *Glossinum, Gelseum, Manganum, Oxalic acid, Fluoric acid, Rhus tox* and *Silicia* may be studied to advantage. *Nux vomica, Phosphorus, Hydrocyanic acid* and *Agaricus* are also worthy of consideration in connection with the various infantile paralyzes. It is not thought necessary to here enumerate their individual symptoms in detail. Each case should be carefully studied and remedies differentiated with great nicety.

CHAPTER XL

HEMIPLEGIA.

General Considerations.—Hemiplegic Manifestations.—Diplegia.—Treatment.—Medication.

General Considerations.—Hemiplegic paralysis is recognized as a disease common to child-life, especially to the early years of life. Of one hundred and thirty-five cases collated by Osler ninety-five occurred under two years of age; it is rare that the disease is seen above ten. It is much more common in the first five years of life than in the second five years, and, again, it is more common to the first quarter of the decade than to any other equal period. It is consequent upon severe labors, especially instrumental deliveries. It also follows from certain of the specific fevers. The pathological lesions may consist of embolism, thrombosis, and hemorrhage, or atrophy and sclerosis, resulting in the waste of entire groups of convolutions or of a lobe of the brain. It belongs to porencephalus, or loss of brain substance, entailing cavities and cysts at the surface of the brain. This latter condition may be the result of imperfect development in utero, or it may arise from hemorrhage occurring at the time of birth. Cortical sclerosis and porencephalus form the true lesions in nearly all cases of infantile hemiplegia, no matter what the cause. Thrombosis is doubtless the cause of nearly all cases that result in softening and loss of substance, embolism forming the foci of softening.

Hemiplegic Manifestations.—The manifestations of hemiplegia in infancy are sudden. There may be violent spasms without any known reason therefor and with attendant loss of consciousness; consciousness may be more or less lost for a few hours only, or the child may drag along for a number of days in a semi- or completely comatose state. As a rule the fever is not pronounced, the case failing to take on the character of inflam-

mation as shown by the subjective and objective symptoms. Upon subsidence of the first convulsions or, possibly, not until later, it will be noticed that an arm or a leg lies limp at the side and is not moved, while, perhaps, the opposite member is moved at will or involuntarily. In the majority of cases the entire right side below the face is affected, though the left side suffers in a fair proportion of cases. In many of these subjects no apparent cause is known for the convulsions; they are ascribed to indigestion, worms, or to a blow or fall that was not severe enough to be taken into notice at the time it occurred. They may also be ascribed to fright, and, perhaps, these and similar causes operate to induce the convulsions in a share of cases, with resulting rupture of a minute blood vessel in the brain, the paralysis being secondary to this condition. If an eruptive fever is the responsible factor in point there may have been a sudden recession of the eruption with convulsions from this cause. It may be that the cerebral vessels were somewhat weakened by virtue of the debilitated condition of the child's system and that, therefore, thrombosis more readily occurred. The paralysis is usually most marked in the arm, and as it is not overcome promptly the member withers and hangs useless at the side. The forearm is generally flexed and the fingers contracted. In special cases the loss of motion is not complete, the child retaining moderate use of the affected arm. If the leg remains involved it is more or less helpless, although its usefulness is not altogether lost as a rule. This form of paralysis is usually limited to the nerves of motion, the sensation of the affected limb remaining normal or nearly so.

It is not the paralysis of the arm or leg, or both, however, that is of the greatest importance and seriousness. Hemiplegic children usually develop into a condition of semi-idiocy, or at best into a condition of mental feebleness. In some cases if pencephalitis is extensive complete idiocy results, and if the child has been paralyzed on one side it is quite probably because of a lack of proper brain development during fetal life and, per consequence, idiocy follows. In other cases imbecility, more or less pronounced, is the result of the convulsions and of the pathological state which ensues. Epilepsy is a common attendant upon this form of paralysis, perhaps one-third of the cases showing hemiplegia in the first years of life, developing epileptiform seizures within a year or two. In many cases these amount to, perhaps, the least form, while in others true Jacksonian epilepsy is developed, especially toward the age of puberty. Children who may have had occasional light convulsive attacks during the teething process, which is retarded in these subjects, develop severer paroxysms later, and as puberty is approached genuine epileptic convulsions occur with great frequency, in some instances as many as several a day.

In special cases the paralysis of the arm and leg is gradually overcome, the only permanent impairment being that of a finger or toe or some special muscle of the face. Perhaps it is a portion of the hand that is left permanently impaired, and if the entire leg has been paralyzed at first it may be slower in regaining its vigor than the arm and never be an altogether useful member.

Diplegia.—Besides hemiplegia, diplegia is seen in child-life, with spasms of all the extremities occurring at or immediately following birth, or attendant upon infectious fevers or severe convulsions, no matter what their cause. In these subjects the paralysis will not be limited to either side, but the legs and arms are equally involved. The sensations are normal and there is no muscular wasting as in hemiplegia. The mental condition is even more profound than in the former; subjects of diplegia are likely to be hopelessly engulfed in idiocy or imbecility. It is this form of paralysis that oftenest follows upon difficult labor. It is much more commonly due to this cause than is hemiplegia, and its subjects lie in almost helplessness for months or years at a time. The legs are much more apt to suffer than the arms. Spastic children gradually regain the use of their arms without being able to handle the lower limbs at all. This form of paralysis is largely dependent upon meningeal hemorrhages at the time of birth, but it may result upon inflammation of the brain and membranes during fetal life. The effusion is apt to be more pronounced over the motor areas and sites than poncephalus, the sclerosis being the result of compression by the effused blood.

Subjects of spastic diplegia may be apparently normal when born and nothing noticeable occur to attract the attention of the physician or nurse, unless there be early and frequent convulsions. As time wears on the child is unable to sit at the age at which it should sit, and as walking time comes it is found that its limbs are not used, while a certain degree of stiffness of both arms and legs is seen. If the child is supported it will rest on its toes and the inner surface of its feet with the knees close together. The rigidity is more pronounced in the lower limbs than in the arms, but it will be early noticed that as the child undertakes to reach out for an object it will have difficulty in grasping it. There is some similarity between the muscular movements of spastic children and children suffering from corea. The arms are moved stiffly and spasmodically and in an irregular manner, and there is more or less incoördination of the movements of the child's arms and hands, with irregularity in the movement of the muscles of the neck and face. In association with this condition there is sometimes seen the combination of spasm and extremely irregular movements of the muscles, termed bilateral athetosis. The head is turned from side to side, the mouth is drawn and distorted and there is pronounced irregularity in the movements of the

face muscles. On making attempts to move there are extraordinary movements of the arms and legs as in exaggerated chorea. These cases are due to pachymeningitis and bilateral lesions of the motor convolutions. Fortunately they are extremely rare.

Treatment.—The treatment of infantile paralysis should be in great measure prophylactic. In many instances these conditions depend upon injury at the time of birth, especially occurring in forceps deliveries and from long-continued head compression. Protracted labors sometimes cause a greater degree and longer period of compression than does the application of forceps. When the latter are applied the child is usually delivered quite promptly, whereas in protracted labor the head may remain impacted in the pelvic outlet for hours at a time, each succeeding vigorous pain driving the head down harder than before and causing that much more compression. In such cases the prophylaxis will depend upon the application of the forceps and prompt delivery of the infant. If convulsions are present at birth or follow immediately these will require treatment; but, unfortunately, not very much can be done until absorption of the effused fluids has taken place. Remedies directed toward the symptomatic indications as seen by the physician are generally unproductive. The case must be reasoned out and treated according to its merits as a whole. If the convulsions and paralysis are dependent upon a lack of prenatal development it is easy to understand that little can be hoped for. Yet even here the administration of an occasional dose of a deep-acting antispasmodic remedy will often accomplish more than can with reason be expected of it. It is believed that the natural tendency of man is toward health, and that when prenatal lesions exist it is either because of some disturbance in the vital forces or to constitutional dyscrasias, whether recognized by the physician or not; and in a fair per cent. of cases in which but little is to be hoped for if prescriptions are based upon objective symptoms alone fairly satisfactory results follow upon the administration of a well-selected antispasmodic.

MEDICATION.—For the convulsions that follow immediately upon birth *Cicuta*, *Zincum*, *Cuprum*, *Belladonna*, *Gelsemium* and *Stramonium* may be demanded. As basic remedies *Sulphur*, *Calcarea*, *Kali carbonicum*, *Psorinum* and *Lachesis* will be found serviceable. *Causticum* is another excellent remedy for hemiplegic paralysis. *Arnica*, *Hypericum* and *Ledum* are especially useful if forceps delivery or long impaction of the head is causative.

Cicuta has convulsions of the limbs, head and upper part of the body; tremulous movements, opisthotonos, with tightness of the chest and interference with breathing. The whole child is involved in violent clonic convulsions.

Belladonna.—Repeated and violent spasmodic paroxysms, flushing of the face, cyanosis, head bowed backward; eyes dilated,

staring and sparkling; constriction of the throat during the spasm; convulsions following upon labor from passive congestion of blood to the brain because of the violence of the labor pains. It differs from *Aranea* in that the latter is especially suited to convulsive attacks following upon long impaction of the head or severe compression with the forceps.

Zincum is better suited to paralysis without convulsions; paralysis of facial muscles and the eyelids. The child lies apparently paralyzed with almost continuous motion of the lower extremities; during spasm the child is pale instead of flushed as in *Bella-donna*. Especially adapted to spasms and paralysis following upon recession of eruptions; paralysis of children whose mother have suffered scarlet fever or diphtheria during pregnancy.

Stramonium.—The convulsions are epileptiform in character; the child is apparently conscious during the spasm, but lies unconscious afterwards; paralysis of the limbs with tremors and twitches; dilation of the pupils, paleness of the face and special cyanosis of the lips during convulsion. Spasms of the chest with paralysis of the left side. Paralysis immediately following upon convulsions will be best met by the remedy whose picture is reflected in the convulsive attack.

Secale cornutum is another excellent remedy in the convulsion and paralysis of young children, and *Gelsemium* must not be overlooked if there is seeming association with eruptive fever occurring during the prenatal period.

Opium, in the medium attenuations, is an excellent remedy in the coma that follows upon convulsions associated with paralytic states.

Thaps will be found an admirable basic remedy if the constitutional state that predisposes to the spasm is that of poena or syphilis. For deep seated constitutional dysensia I have found excellent results from the use of *Sulphur* for a few weeks, to be followed by *Thaps* for a like period of time, going back again to *Sulphur* and so alternating, or, more properly, rotating these remedies.

For severe convulsions occurring at the time of birth leading to paralysis it may be necessary to overcome the severity of the spasm by anesthesia. The inhalation of a few drops of chloroform or ether will sometimes materially modify the severity of the spasm and render the child less likely to suffer from post-convulsion paralysis. The effects of anesthesia are transient, and I have never found it harmful.

Among other remedies that may be mentioned in connection with infantile convulsions and paralysis are *Capræ aceticæ*, *Fluobæm*, *Cocculus*, *Zincum aceticum* and *Kali phosphoricum*.

CHAPTER XLII.

MYELITIS.

General Considerations—Acute Central Myelitis—Transverse Myelitis—Anterior Poliomyelitis—Pathology—Diagnosis—Symptoms and Course—Sequelæ—Adjuncts—Medication.

General Considerations.—Among the inflammatory lesions of the cord that are commonly seen in children is that in which the gray matter of the anterior horns of the cord is involved in an inflammatory process with resultant paralysis. It does not belong wholly to child-life, but is seen as one of the especially common diseases of the spinal cord in children. It is met with as an independent inflammation resulting upon exposure to severe cold or unusually violent exertion, the symptoms being those of acute ascending paralysis and loss of power therefrom. It is also seen as a sequel to zymotic diseases, and as a result of caries of the vertebrae, from infection of the spinal cord from this cause, in consequence of injury and violent concussion of the spine, and also as the result of disease of the cord itself.

Acute transverse myelitis also occurs in children but is less common. While not often seen before ten years of age it attacks vigorous boys above that age who indulge in the violent games of boyhood and suffer exposure to severe cold while heated.

If the disease-process be localized it may affect both white and gray matter, this being more likely to be the condition after accidents or acute compression of the cord from the development of tumors, and from hemorrhage into the spinal marrow. Unless destructive inflammation follow upon accidents whereby the white and gray matter are equally affected or the distinction between them lost the gray matter is alone or chiefly involved. There may be a localized area of hemorrhage within the gray substance, and in disseminated myelitis the membranes take on the inflammatory process, in which case the condition is really myelo-meningitis.

Acute Central Myelitis.—The onset of acute central myelitis resulting from cold or injury is sudden. In special cases it is preceded by severe pain in the legs and back, and a peculiar girdle pain around the waist is also experienced. If of the inflammatory type it may be ushered in by a violent chill, with fever from the start, and convulsions may occur in association with these symptoms. In other cases the initial symptoms are less violent, and tingling, prickling and numbness, as of pins and needles in the feet, or rheumatoid pains and distension and early

loss of muscular power, will characterize its onset. Loss of sensation and motion in the lower extremities early occurs, with incontinence of feces and urine. The part of the spine most commonly affected is the dorsal region. In individual cases instead of loss of sensation at first there may be hyperesthesia with paralysis following. The muscles waste rapidly, the skin is congested, the temperature of the affected limbs is lower than normal, the pulse is rapid, the tongue is dry, delirium soon follows and the fever increases until the thermometer registers 106° or 107° . The reflexes are more or less absent, usually completely so. All degrees of motor and sensory paralysis are witnessed. In the severest cases almost all power is lost, the child's legs dangling helplessly.

The course of the disease is variable. Acute cases last but a few days. Those following upon infectious fevers run a longer time and a milder course. If the lumbar enlargement be affected there is, besides complete motor paralysis, rapid wasting of the muscular system, and the rectal and vesical sphincters are completely relaxed. If the cervical portion of the cord is affected the arms are paralyzed and death may supervene upon interference with the nerve supply to the muscles of respiration.

DIAGNOSIS.—The diagnosis of acute central myelitis is difficult. It may be confused with that of acute ascending paralysis described by Landrey and bearing his name, and with certain types of multiple neuritis. But in Landrey's paralysis the nerves of sensation are not so much involved nor is there the rapid muscular wasting, paralysis of the bladder and rectum, nor the severity of fever. Myelitis is more like multiple neuritis, from which it is distinguished, however, by the fact that the anesthesia is more complete and the wasting more rapid. The bladder and rectum are not apt to be involved in neuritis nor are the trophic changes and development of bed sores and bullae, which are quite common to central myelitis, seen in association with multiple neuritis. Landrey's paralysis is more apt, too, to have twitchings of the legs, something like St. Vitus' dance; whereas, the degree of paralysis of the lower extremities in the disease under consideration is much more pronounced.

Transverse Myelitis.—There is a transverse variety of myelitis that is seen in children, in which the inflammation is most common to the dorsal region. In this type there are initial pains, numbness and tingling of the feet and legs. Paralysis ensues quickly, even following upon evidence of a slight cold in the course of a few hours. As a rule it is deferred for a day or two, being preceded by sensations of heaviness, pain and dragging of the legs. The "girdle sensation" exhibits early, and examination of the spine will show a zone of hyperesthesia opposite the seat of the lesion. The trophic changes are not as

pronounced as in central myelitis, but the muscles become flabby, though not wasted to extreme degree. If the gray matter of the cord is involved muscular wasting is more pronounced. Eventually the limbs become more or less rigid. Instead of paralysis of the bladder and bowels there may be at first retention and constipation with eventual incontinence of urine. If the lumbar region is especially involved in the paralysis the bladder is more likely to show irritation from the start, but the bowels are constipated.

If transverse paralysis occurs in the cervical region the upper extremities are more or less paralyzed and there is gradual loss of sensation. The paralysis is complete below the point of lesion, though in rare cases only the arms will be affected. Vomiting, hicough, and slow pulse may present in connection with myelitis of the cervical portion of the spine, together with difficulty of speech, dyspnea and perhaps syncope; these symptoms showing without other traceable cause, and especially if attended by abnormally slow pulse, the heart not beating more than twenty to thirty beats per minute, prompt the suggestion of inflammation of the cervical portion of the spinal cord.

Anterior Polio-Myelitis.—This disease is commonly met with during the first three years of life. It is characterized by fever and rapid emaciation with the association of the condition ordinarily known as "infantile paralysis." The same condition occurs also later in life, but, according to Gowers, at least four-fifths of the cases present prior to the third year. Its cause is not clearly understood. It has been charged to acute colds, the irritations of teething, to injuries at the hands of nurses, and to the acute exanthemata. It is seen in association with measles, typhoid fever, scarlet fever and pneumonia, though not more often associated with any of these diseases than with the summer bowel-complaints of children. It has been suggested, too, that this type of paralysis is often due to the vigorous and early efforts of children to walk. It is more commonly seen in girls than in boys, and is more common also to the heated months. Like many other diseases in which the circumstance is not explicable it seems at times to go in waves, almost as epidemics. Such an epidemic occurred in the summer of 1894 in Vermont.

PATHOLOGY.—The pathological seat of anterior polio-myelitis is either in the cervical or lumbar regions. The lesion is often described to be an acute hemorrhagic myelitis or degeneration and rapid destruction of the large ganglion cells. The membranes may be involved in the process in individual cases, but the anterior cornua of the gray matter is most positively involved in acute inflammation. If the case be unusually severe the inflammatory process may extend to the gray matter of the dorsal region. The chief damage to the cord results as effusion of blood in its most vascular part, and as this is in the anterior cornua where the

large nerve-cells are situated it is easy to understand why this portion of the structure is most affected. Sclerotic changes occur chiefly in the pyramidal tract, where the anterior cornua is largely atrophied. Atrophy of the anterior nerve roots also occurs, and the muscles from which they are supplied undergo degeneration and atrophy. During the acuteness of the symptoms it is quite likely that the whole cord is involved in the inflammatory process, but as this subsides the exudation takes place from the blood vessels of the anterior portion. Hence the involvement of this section of the spinal marrow. Absorption of the inflammatory material, with partial repair of the damage, results in improvement in the muscular powers in greater or less degree, according as the degree of recovery that takes place, and in shrinking and cicatrization of areas most involved in the inflammatory process, followed by permanent paralysis of muscles supplied by the destroyed nerve centres.

DIAGNOSIS.—The initial symptoms, as fever, delirium and convulsions, are present in so many cerebral and spinal diseases as well as in other acute diseases that it is not always easy at first to diagnose polio-myelitis anterior. The flaccid, flabby, rapid wasting, lax state of the muscles and the absence of the reflexes will diagnose it from the paralysis belonging to cerebral inflammation. Following upon the acute manifestations mentioned the loss of power of the legs, rapid atrophy, and hyperesthesia of the skin, are absent, and the characteristic bone-changes and relieving sweats belonging to the pseudo-paresis of rickets are not present; nor is the painful hip belonging to paralysis attendant upon hip-joint disease seen in association with this ailment. The degree of fever, the abruptness of the paralysis, the quick emaciation and the extreme wasting will differentiate it from other forms of paralysis of childhood.

SYMPTOMS AND COURSE.—The initial stage of polio-myelitis anterior is likely to be attended with fever, restlessness, convulsions and cerebral disturbances. It is especially apt to be associated with the gastro-intestinal diseases of children and with dentition, and if occurring during the presence of other acute ailment may not be noticed until the child has lost the use of a limb. The paralysis is abrupt, and the fever which attends the inflammatory process is not severe, rarely registering higher than 103° , and sometimes not more than 100° . Pain is not complained of as a rule. The fever leads to vomiting, diarrhoea and general prostration, and when these symptoms occur in association with teething they are very apt to be misleading.

The onset of the paralysis is not only sudden but its distribution is extensive and its character severe at first, much more so than it is destined to remain. It is not unusual to find both legs paralyzed, but recovery follows to that degree that eventually only

individual muscles or sets of muscles of one member will remain permanently involved. So also with the arms; at first both may be paralyzed and none of the joints can be voluntarily used. Finally the paralysis passes off, excepting in three or four muscles of a single arm, or perhaps an entire portion of one arm. In rare cases both arms and legs are involved in the initial lesions, recovery of all but a single member or portion of that member occurring within a few months. The usual form of the paralysis is of the flaccid, atrophic variety. Each paralyzed muscle is soft and yielding, having lost its mechanical irritability and tendon-reflex. It suffers in nutrition, too, so that within a few weeks diminution in the size of the affected limb is observable. So long as the entire limb is involved its position will depend altogether on the force of gravitation, as it will fall in any position or attitude which the posture of the child allows. A record of thirty-one cases gathered by Starr shows that both legs were involved in nine cases, the right leg in six, the left leg in six, the right arm in three, the left arm in one, both arms in one, an arm and a leg in two, the trunk with both legs in one, the trunk with left leg in two, and both legs and both arms in one, showing a general distribution of the paralysis remaining as a permanent affection. It is sometimes a month or more after the child shows paralysis before the initial symptoms sufficiently subside to enable the physician to determine the degree of permanent impairment.

SEQUELÆ.—Contractures result in a great many cases, the contracture depending upon the individual muscles involved. Portions of the hand are contracted where individual muscles of the forearm are paralyzed; so also with the foot; and contractures occur about the elbow and knee or other joints when individual muscles operating against other muscles to preserve the anatomy of the limb and joint suffer paralysis, contractures occurring, of course, in the direction of the sound muscle.

Atrophy is a pronounced feature in infantile paralysis. It develops rapidly, and is profound in muscles whose nerves are permanently paralyzed. It may not be especially noticeable for some time in well-nourished children, while in thinner subjects it is observable earlier. The lesion affects the growth of the paralyzed limb so that its fellow soon outstrips it, and as the child progresses in age the atrophy becomes more apparent by comparison. The limb may be shorter than its fellow, very much smaller in circumference, and in every way weaker as the degree of atrophy progresses, especially when the muscles about the joints are involved; the support given them by the muscular cords is weakened and the joints become abnormally movable, due to subluxation.

Sensory symptoms are not usually permanent in infantile paralysis. In most cases they are totally absent, rendering the

differential diagnosis of this disease, which, in fact, is the only form of spinal paralysis observed with any frequency in childhood, comparatively easy.

Treatment.—It is necessary in treating the paralysis belonging to anterior polio-myelitis to preserve the nutrition of the limb and protect it from injury. It should be more warmly clad than in health, and as it is likely to swing heavily and be in the way of the child's efforts at locomotion and other exercises it is better that it be carried in a sling or supported by a brace, in order that the tendency to gravitation and consequent stretching of the ligaments and muscles entering into the composition of the joints be avoided in so far as possible.

Massage, systematically applied, hot and cold douches, oil baths of the affected part, and perhaps electricity, form the local treatment of this form of paralysis. Electricity should be directed toward the regeneration of the nerves and the proper nutrition of paralyzed muscles. For this purpose galvanism is the form to be selected. It may be used as a continuous current or applied as an interrupted current. When the former is selected the flat electrode is placed over the back of the neck or between the shoulders and the other electrode is gently stroked along the affected limb without being lifted from the skin. The sances should be daily, or every other day, not lasting more than five or six minutes, and of not more than six or eight milliamperes, the object being to promote the chemical process lying at the base of nutrition and regeneration in both muscles and nerves. The application of the interrupted galvanic current has quite a different object, it being directed toward strengthening the muscles by inciting them to action, just as any muscle is developed by exercise. Voluntary action is suspended in muscles whose nerves are paralyzed, and it becomes necessary to substitute artificial exercise. This might be accomplished by faradic electricity, but it has been demonstrated in the treatment of these cases that the interrupted galvanic is clinically superior. In the second method one of the poles should have the key-electrode, by which there can be a break in the circuit by application of the finger to the key without removing the electrode from the affected muscle, it being desirable to cause frequent interruption, since muscular contraction is not caused by the current passing through the muscular fibre but as it is applied and suspended. The theory of the mild application of but a few milliamperes is to cause gentle muscular exercise to individual fibres rather than the harsh, sharp contraction which sometimes induces electrical fatigue if the current be continued too long or applied too strong. Daily or alternate day sances of a few minutes, with a clear understanding of the objects to be attained in each case, the proper currents in proper strength being used, will result in improvement in atrophied muscles.

within a very few weeks, while the application of the continued galvanic current as already described, improves the chemical processes that are going on, resulting in benefit to the impaired nerves.

MEDICATION.—Remedies that will be called for in the treatment of infantile paralysis are, more especially, *Causticum*, *Cocculus*, *Arnica*, *Rhus*, *Belladonna*, *Arsenicum*, *Aluminum*, *Phosphorus*, *Plumbum* and *Zincum*.

Plumbum has paralysis of the extensor muscles of the wrist with wrist drop, accompanied by atrophy of the affected part.

Rhus is more especially suited to rheumatic paralysis arising as the result of getting wet, or to chronic rheumatic children or to children of severely rheumatic parents.

Zincum is more especially applicable to paralysis from cerebral softening; but it may be found useful in paralysis arising from spinal disease due to sudden recession of eruptions, with vertigo, trembling, numbness and formication.

Gelsemium, which should have been mentioned in the foregoing list, is especially beneficial when there is loss of muscular control; trembling of the limbs; paralysis from diphtheria or scarlet fever or from other acute disease.

Aluminum is especially to be thought of in spinal paralysis. It is not only applicable to infantile paralysis from spinal softening but belongs also to tabes dorsalis and other types of spinal derangement.

Causticum, while more especially applicable to paralysis of the throat and face is beneficial in those forms that affect the upper extremities.

Colchicum is suited to the rheumatic type of paralysis.

Cocculus, *Cuprum*, *Rhus* and *Sulphur* will be called for in paralytic states dependent upon typhoid fever.

Phosphorus will often be found useful in the paralysis of children depending upon spinal disease, the typical *Phosphorus* complexion and constitution giving the cue for the remedy. Progressive paralysis with the intellectual faculties preserved; paralysis with twitching and muscular contractions in the paralyzed parts.

Cocculus is often the remedy for paralysis following upon epileptic convulsions or other spasms; spinal irritation with nightly boring pains in the spine and extreme prostration after spasms; child recovering with more or less remaining paralysis.

Paralysis following upon recession or suppression of eruptions may need besides *Zincum*, *Causticum*, *Dulcamara*, *Hepar* and *Sulphur*. If from suppression of perspiration by cold, damp winds, *Colchicum* and *Rhus* will probably be needed.

If the sensory nerves are involved in the process *Plumbum* and *Silicium* are especially indicated, while, if the motor nerves alone are paralyzed *Gelsemium* will often be found to be the remedy. If

both motor and sensory nerves are paralyzed, besides *Cannabis* and *Rhus*, which stand forth more prominently in this connection than the others, *Arsenicum*, *Belladonna*, *Iguatia* and *Nux. vomica* may be needed in individual cases.

If dependent upon profound constitutional dyscrasia, with characteristic constitutional habit and temperament peculiar to the deep-acting antipsoric remedies, it will be well to always base the treatment upon these agents, selecting such other medicines for local conditions as the case may seem to demand. *Sulphur*, *Calcarea*, *Silicia*, *Psorinum* or *Tuberculinum* may prove to be the basic remedy, while *Cannabis*, *Aluminum*, *Plumbum*, *Rhus* or other well indicated agent may be used successfully intercurrently.

Epidemic paralysis will need the epidemic remedy of the season or of the disease that may be prevailing at the time of its occurrence, and which is usually the cause of the paralysis. Anterior polio-myelitis is seen in very hot weather, in association with dentition, and perhaps with simple congestive conditions of the brain and cord due to heated terms. Here *Belladonna*, *Stramonium*, *Glochinum*, *Hyoscyamus*, *Solanum*, *Aconite* and similar remedies will be needed. But epidemics of this disease are so rare as to be curiosities. Three or four are mentioned as having occurred in Europe, and that occurring in Vermont during the summer of 1894, in which not only children but small animals, as chickens, pigs, sheep, calves and the like were affected, and in which considerable mortality, probably in good part from treatment given, ensued, is the first recorded in America.

CHAPTER XLII.

LOCOMOTOR ATAXIA.

General Considerations—Symptoms and Course—Diagnosis—Prognosis—Treatment—Adjuncts—Medication—Electro-Therapeutics.

General Considerations.—Locomotor ataxia is a form of spinal sclerosis in which the posterior columns of the cord are affected. It is characterized chiefly by pains, incoordination in action of the lower extremities, paresthesia, diminution in or complete loss of reflexes, and slowly progressive paralysis. When seen as an hereditary affection it is called hereditary ataxic paraplegia. The name "Friederich's Disease" has been applied to locomotor ataxia in child-life.

Ataxia is met with more frequently in boys than in girls, in the ratio of about ten to one. It is by no means confined to child-life, belonging, in fact, more commonly to adults. Less than one-

fourth of the cases are seen under thirty years of age and but a small proportion under twenty. In those occasionally met with in children a peculiar feature of the disease is instanced, in that it runs through families, occurring from generation to generation. Occasionally a generation escapes, but when it does atavism is apt to occur.

The sclerosed posterior columns of the spinal cord assume a grayish-yellow color in ataxia, and undergo granulo-fatty changes. The dorsal and lumbar portions of the spine are most affected, and at these points the membranes are usually found adherent. In the dorsal region all portions of the column are affected, while in the lumbar only the posterior region of the posterior column shows signs of disease as a rule. Certain of the cerebral nerves, as the trunk of the optic, and those branches which supply the muscles of the eye, especially the oculo-motor are affected. Both halves of the cord seem to suffer alike, the process being symmetrical. It is one of pure degeneration and is not looked upon as an inflammatory process.

Ataxia is seen more especially at the developing periods of life, in children about seven and eight years of age, and next most often in young subjects at the age of puberty. It is a curious fact that it is most commonly seen at any age of life on the cycles of seven. This rule is not absolute, but approximately correct.

Symptoms and Course.—The symptoms of locomotor ataxia may be divided for convenience of description into classes; those that are accessory, those that are atactic, those that are paralytic. There is no especial order of sequence in the appearance of the symptoms of these different classes, which may be alternate and appear in any order in any stage of the disease. The accessory phenomena show themselves throughout the whole course of the ailment, while paralysis is limited to the later stages. Symptoms of the atactic class are the first to show.

The accessory disturbances consist, first, of peculiar pains, which are lancinating and like sharp electrical strokes shooting through the body and pelvis and lower extremities. They are more commonly felt down the limbs. These pains are sharp and decisive. They occur with lightning-like suddenness in paroxysms, during a day or covering several days, with intermissions, or continuing weeks or even months. While not very severe as a rule they may be severe and constantly present. Besides pain there are anomalies of sensation. The surface of the limbs may become almost insensitive to what would ordinarily be severe irritations. The perception of pain or the transmission of the sensation of suffering is delayed, and while the skin may be sensitive to the prick of a pin it may be sunk clear through the skin with scarcely any consciousness of it. The soles of the feet are especially subject to paresthesia. They seem not to rest upon the floor firmly,

but as if the patient was walking on velvet or cushions. There are sensations of the peculiar girdle pain, or pain as of a tight band around the abdomen, so tight as to be painful. In subjects in whom locomotor is developing there may be absence of the ordinary manifestations of pain in certain acute diseases. Pleurisy, for instance, may be painless, and thus the diagnosis be confused.

Among the more permanent symptoms of locomotor ataxia in this stage is the characteristic gait, resulting upon lack of co-ordination of the muscular system. The course of the nerve impressions is from the brain to the extremities, or from the extremities through the cord to the brain, and may be so broken or interfered with that it will be necessary for the patient to concentrate himself upon his efforts by the aid of sight and consciousness of what he is doing. He is unable to stand or to walk perfectly with his eyes closed, and however unsteady his gait he walks more clumsily and awkwardly when they are closed, reeling to one side, usually the left. This tendency has been very aptly suggested in the expression that atactic patients are compelled to steady themselves in order to walk as though carrying a bucket of water on the head. The feet are planted in a mechanical way; in raising the eyes from the ground or being diverted otherwise, atactic patients stumble and fall. This gait is a staggering gait and not the stamping of the feet against the ground that belongs to tabes. While in the ordinary course of locomotor the lower extremities are chiefly affected, yet the upper extremities may become involved if the disease extends, so that the arms are affected and the muscles of the throat are interfered with, rendering the speech drawling, hesitating, and even explosive in character. Nystagmic movements occur, and sometimes the patient is unable to fix his eyes upon any particular point without a minute or two of extra effort in this direction. Occasionally double vision and strabismus are seen, but not often. The pupils are somewhat dilated in special cases, while in others they are contracted. The iris reflex is lost in most cases, while in others the muscles are involved, from slight transitory paresis even to total paralysis. In the severest type of the disease atrophy of the optic nerve may occur, with eventual partial or total blindness.

As may be imagined, the muscular power of the patient is unusually greatly reduced. If the anterior horns of the cords be involved or if peripheral neuritis occur there may be distinct atrophy, with eventual severe emaciation as the patient becomes helpless. Ordinarily, the muscular involvement is limited to paresis, and at most to paralysis of individual sets of muscles. The facial expression of pronounced ataxia subjects is peculiar. The facial lines are not distinctly drawn; the muscles are relaxed, the eye-lids drop, and the eyes look heavy, the child sits with its mouth partly open, and the expression is that of general indiffer-

ence and apathy. In some cases it amounts to the look of imbecility. The expression lacks the interest and vivacity of child-life, and even pleasurable emotions are not readily depicted in the countenance. If the disease comes on about the age of puberty there is sluggishness of the sexual functions and a greater degree of mental involvement. The sexual attributes are delayed and fail to develop. If the disease comes on in early life, its subjects become physically, sexually and even mentally imbecilic. In older subjects the mind is not usually involved, except that atactic patients seem to become early reconciled to the incurability of their ailment. They eat to

live and live to eat. Even in child-life atactic patients are possessed of good appetites and fair digestive powers as a rule. The bowels may be affected, even chronically constipated, and pronouncedly atactic children may suffer paresis of the bladder muscles until it is necessary to give attention to them in this particular. If the subject of ataxia



FIG. 44.

is also the subject of skin disease treatment is apt to be resisted. Atrophic changes, severe bone-pains and alteration of joints, perforating ulcers, especially of the feet, excruciating pains of the internal organs, lungs, kidneys, stomach, which are the so-called crisis of ataxia, are occasionally seen in unusually severe cases. The illustration, Fig. 44, from Gowers shows a perforating ulcer of the foot of tabes.

Locomotor ataxia drags out its slow course over a long period of time, sometimes over a lifetime. It is rarely fatal, but its tendency is toward physical helplessness. Individual cases are bed-ridden for life, while others have long periods of temporary or slight improvement only to have recurring outbreaks of ataxic manifestations with eventual permanent establishment of its symptoms. It is not often amenable to treatment, but if seen early and effective constitutional treatment be persevered in over a long period of time, together with such adjuvants as have been found helpful, its course may be modified and its progress at least held in check. It is doubtful if it is ever curable. As seen in children it is considered hereditary in almost every case. Here it progresses more slowly and is not likely to be attended by the severity that is expressed in middle life. Nor is there the same degree of affection of the bladder, and eyesight.

Diagnosis.—The diagnosis of locomotor ataxia is not difficult. No other disease has the peculiar lancinating pains, the loss of knee-jerk, the characteristic reduction of sensibility, the peculiar gait, and the combination of halting speech, nystagmus, relaxed facial expression and the various paresthesias. If develop-

ing toward puberty the sexual impotence, mental sluggishness, and gradual progressive helplessness of the subject will differentiate it from every other disease of the nervous system.

Prognosis.—As may be inferred from what has already been said the prognosis in locomotor ataxia is always grave. It rarely causes death, the patient progressing into a gradual helplessness to become a chronic burden to himself and family. Acute myelitis occasionally terminates the case quickly. Locomotor children are liable to all the diseases of child-life and are less resistant to their invasions. The natural outcome is a greater or less degree of helplessness without going on to complete imbecility, and not often resulting in abject helplessness.

Treatment.—Locomotor ataxia seems to have its basis away back in the ancestral tree, and occasionally more directly than this, in the existence of syphilis in the family. But it may be long also to other dyscrasias which are not altogether understood, it being very difficult to explain many of the apparently hereditary diseases of the nervous system. Its long continued course and certain downward progression suggest the wisdom of profound constitutional treatment, and here it is believed homeopathy has more advantages than other lines of practice. If clearly of specific origin the anti-syphilitics are required, as *Mercurius*, *Potassium*, *Syphilinum*, *Thuja*, *Kreosotum* and *Nitric acid*. If apparently dissociated with syphilis and more clearly of idiopathic nerve-degeneration origin *Phosphorus*, *Arsenicum*, *Silica*, *Calcarea*, *Kali phosphoricum*, and remedies of like type will be thought of. If apparently of syphilitic origin engraved upon a psoric base *Sulphur*, *Barium*, *Calcarea*, *Silica*, *Fluoric acid* and allied remedies must be adopted. It will be sufficient to suggest that the more grave the condition of the subject, including the enfeebled ancestral history, the less probability there is of even modifying the disease by medication. Individual symptoms, as severe pain, disturbance of vision, unusually rapid development of paresis, inveterate constipation, derangement of the bladder, will require attention during the progress of the treatment. But no permanent improvement can be hoped for in locomotor ataxia except from carefully selected constitutional treatment, conducted systematically over a long period of time; and it must be borne in mind by the beginner that these cases are very subtle and generally hopeless, and it will not do to promise anything in the way of relief. I have known very satisfactory results to attend upon application of remedies to individual subjects, sometimes in apparently hopeless cases of locomotor, in some even establishing a very satisfactory degree of improvement, and retarding the apparently certain downward progress of the disease; but I do not know that I have ever witnessed that degree of improvement that would justify me in hoping for permanent recovery.

ADJUVANTS.—Because of the unsatisfactory results that have attended the medicinal treatment of tabes every conceivable mechanical measure has been practiced by the old school. Among the more recent attempts at mechanical treatment may be mentioned the suspension of the body by an apparatus applied to the head and shoulders whereby the patient's weight is lifted from the floor and he is suspended with only his toes touching the floor for from half a minute to three minutes at a seance. Systematically persisted in, this treatment is reported to have been attended by good results. Bonuzzi has suggested instead of the suspension treatment a new method, the patient lying upon his back, the head maintained in elevated position by means of a pillow, the lower extremities flexed upon the body, forming a semicircle, the hands placed upon the chest of the patient and the legs held straight. The operator seizes the diverging ankles and brings



FIG. 45.

them over the patient's shoulders directly toward the floor. (Fig. 45.) This maneuver is said to accomplish three times the degree of stretching of the spinal cord that is secured by the suspension method. Benedikt, of Vienna, claims to have obtained apparently astonishing results by this method; he reports that patients who

were quite powerless to walk or stand were subsequently enabled to take long promenades. It is claimed that the beneficial effect of this mechanical treatment is more pronounced in the neuralgic attacks of locomotor than those following suspension. In both treatments it is attempted to produce stretching of the spinal cord and thus secure relief from the degeneration that is going on.

Another method of mechanical treatment has been instituted by Frankel in which ataxia subjects are trained to regain coördinate control over their muscles. They are instructed to perform certain regular exercises for from half an hour to an hour daily, beginning with simple movements of the fingers and other small members and continuing with easy coördinated movements until they are finally able to take up complicated coördinated exercises. Frankel claims to have been able to follow up systematically these efforts at mental control of the muscular system and to secure very satisfactory results in the treatment of tabes, especially in commencing cases.

Among the more recent therapeutic suggestions for the treatment of locomotor-ataxia Koch's tuberculin, Poehl's spermine

and the Brown-Sequard testicular fluid have been tried. Neisser reports satisfactory results with tuberculin, and Depoux, Bahinski, Benedikt and Westphal support Depoux's conclusions that the Brown-Sequard fluid occasionally secures a cure. So far as can be learned from a careful perusal of recent literature on this subject the method recommended by Roemmer and so heartily approved by Benedikt has more to commend it than any of the other measures spoken of. The suspension treatment promised excellent results several years ago, but it has quite gone out of favor with the profession at large; nor is it believed that efforts at direct medication with tuberculin, spermine or testicular juice are deserving of more than passing notice. Frankel's attempts to cure locomotor by the patient's efforts to control his muscular movements has much to commend it so long as the patient's mind is not affected. Unfortunately, however, in the ataxia of children, which is so often hereditary, it is not reasonable to expect them to exhibit any considerable degree of effort in this direction.

MEDICATION.—The homeopathic treatment of locomotor promises better results than any or all of the methods at present in vogue in old school practice; and if the deep seated constitutional remedy that is suited to the individual case be exhibited over a considerable period of time, supported by the application of special remedies that may be demanded by unusual individual symptoms, the very best that is possible according to present knowledge will have been applied for the patient's relief.

The metals seem to have especial affinity for the spinal cord and nerves. *Aluminum, Argentum, Plumbum and Zincum* are among the best remedies for ataxia.

Aluminum has great muscular weakness, and impairment of coördination; confusion and obscuration of intellect; patient totters when attempting to walk with his eyes shut. The soles of the feet feel as though they are too soft and swollen and are painful when stepped upon. There is great weakness and uncertainty in the lower limbs. Child has to be led; its arms and legs hang heavily and clumsily as it sits. Indisposition to physical or mental effort. Child prefers to remain perfectly quiet. In youths and adults the mental state is one of resignation and acceptance of the situation. This is a characteristic symptom and will help determine the selection of the remedy. The *Aluminum* child is constipated and the rectum is without power to expel stool, no matter what its consistency.

Argentum nitricum.—*Argentum* has mental confusion, with tendency to fall sideways. Vertigo when walking with the eyes closed, so that the child staggers and grasps hold of things. Legs feel heavy; pains in the small of the back, very severe when rising from a sitting posture. Drowsiness during the day and loss of pupillary reactions; girdle pain around the body, debilitating and

shriveling the sexual organs, in children stunting their development.

Zincum metallicum is especially useful in commencing locomotor ataxia with sharp lancinating pains, great weakness of the limbs, especially the lower limbs, sense of heat and burning in the spine. Restlessness during sleep, tossing of the limbs and feet about the bed; won't keep still. *Zincum* in association with *Phosphorus*, in the phosphide of zincum, was highly recommended by the late Dr. William H. Holcombe, of New Orleans, for locomotor in the incipient stages.

Plumbum metallicum is especially adapted to advanced cases of tabes, and disseminated sclerosis. Paroxysmal lancinating pains in the limbs, worse at night; total loss of co-ordination and paralysis of the limbs; atrophy of mind, body remaining plump. Severe girdle pain, and colic pain in the abdomen. Child severely constipated; stools hard and knotty, and expelled with great muscular effort. The combination of this characteristic constipation, paralysis of the lower limbs, and abdominal pains, the solar plexus being the chief seat of the abdominal suffering, together with torturing, lancinating pains up and down the legs, forms a picture that *Plumbum* will often efface, in greater or less degree.

Gelium—This remedy is more especially adapted to recent cases in which the symptoms partake of the character of weakness and exhaustion rather than paralysis. Mental exhaustion; confusion of the intellect; diplopia, strabismus and ptosis; aching in the small of the back, with contraction between the shoulders and in the back of the neck. The genitals, even in young children, are cold and relaxed.

Phosphorus is suited to the subject with burning heat in the back, great irritability and nervousness, trembling from slight exertion, clumsiness of gait, and localized anesthesia.

Rhus tox. and *Colchicum* should be carefully studied when ataxia is the result of rheumatism or over-exercise, it frequently appearing in a rheumatic family as an hereditary ailment.

Fluoric acid, *Nux vomica*, *Secale* and *Sulphur* are also to be carefully considered in special cases. No remedy, unless it be *Plumbum*, has the girdle pain more pronounced than *Sulphur*. *Calcarea carb.*, *Calcarea phosphorica*, *Calcarea fluorica*, and *Kali phosphoricum* will be found beneficial in individual cases in which their symptomatology is pronounced. As constitutional remedies the calcarens will often be found of service. *Sulphur* and *Platina* may be needed in the tabes of young girls as they approach puberty; *Arsenicum*, especially the iodide of arsenic, will be called for in occasional cases when there is associated with the paralysis of ataxia the strictly *Arsenicum* constitution. Grunvogel commends the *Acetate of Manganese*, *Cyclamen*, *Oryzma*, *Belladonna*,

Gyalola and *Ammonium muriaticum* as remedies that have been found beneficial in the treatment of this disease.

ELECTRO-THERAPEUTICS.—The treatment of locomotor ataxia by electricity has received a good deal of attention but it cannot be said that the results are altogether satisfactory. Morton, New York, highly commends the application of galvanism, the treatment being continued over a long period of time. He recommends that the electrodes shall be large, and that at first a current of moderate strength, two milliamperes to the square inch, be applied for ten minutes of time daily. Later the strength may be increased to the point of toleration and the source prolonged to twenty minutes. Both stable and labile applications are practiced. The stable electrodes are placed on the nape of the neck or the lumbar region, or they may be placed in any position over pain in the spine. It seems to be good practice to use both electrodes alternately, moving one up and down the spine while the other is fixed, and vice versa. Especially painful parts are treated by the application of the stable anodes, and other special symptoms are also treated by electro-therapeutics. Morton cautions that it is especially important to include treatment of the nerve roots and peripheral nerves, "since they as well as the posterior columns are in many instances the seat of pathological changes, if indeed, they are not even the original starting points of the disease."

Faradization has also been used with success in individual cases. The use of the farado-cutaneous brush is especially recommended in cases where pain and paresthesia are present. Besides faradization and galvanization the treatment of tabes by franklinization is commended. In order to be successful the machine used should possess at least three revolving plates of twenty-six inches in diameter each. Such a machine should be able to develop thick percussive sparks from four to eight inches in length, to be administered over the spine, nerve roots and trunks, to muscles and parasthetic areas, "and to all points which are undergoing impressions that may be caused to impinge upon the spinal gray matter or to affect the spinal circulatory mechanism." A very vigorous and complete treatment would be carried out by this means in about fifteen minutes. Morton claims to have secured in hospital practice pronounced improvement by it in cases in which galvanism and faradization had failed of success. While not contending that this form of electricity has produced cures in his hands, he claims to have seen the suffering and atactic pain, anesthesia, bladder and sexual symptoms, and all other symptoms disappear and the gait become normal. Even in the second or atactic stage of tabes he has arrested the disease for years, relieving the pains and cries, and retaining a fairly natural gait. I have not used the franklinic treatment, but have witnessed benefits from it at the hands of others. Galvanism

has proven beneficial in allaying the severe pains down the limbs and the sense of soreness and aching in the lumbar region, but I have never known it to be permanently productive of good results.

The use of sedatives, as the cold tar derivatives and opium, is to be condemned; even the best old school authorities are now disclaiming their usefulness in the pain of locomotor ataxia and their baneful effect upon the nervous system generally. They offer nothing to be desired, and only interfere with the effect of the well indicated homoeopathic remedy. Lately the vacuum treatment is being extravagantly praised. I am not yet convinced that it is possessed of merit.

CHAPTER XLIII.

PSEUDO-HYPERTROPHIC PARALYSIS.

General Considerations—Diagnosis—Etiology—Treatment.

General Considerations.—Pseudo-hypertrophic paralysis is a disease of early child-life. It occurs much more commonly before ten years of age than later, and is seen four times as frequently in boys as in girls. It is especially observed during the period of active development of the physical form, or upon the first efforts of the child to walk, entailing a clumsiness in the use of the limbs and rendering the walk a straddling, shambling gait. It is difficult for the child to ascend the stairs or to lift the foot up to anything.

As the name implies there is an apparent increase in the size of the muscular structure of the legs, when the lower limbs only are affected, but instead of the enlargement consisting of actual increase of muscular growth the muscle is reduced in amount, the enormous increase arising from the development of an excessive amount of interstitial fat. The muscles that first show this apparent increase are those of the calf of the leg. The glutei also become involved, and the muscle of the lumbar region and shoulders take on the increase. Next to the calf muscles the infra-spinatus is most often affected, and the enlargement may be so great as to be mistaken for the scapula. The muscles of the hand and forearm



FIG. 46.

mistaken for the scapula.

are not often affected, nor are the muscles of the face and neck, although these may be occasionally involved in the hypertrophic process.

Individual cases of pseudo-hypertrophic paralysis show such enormous enlargement of special sets of muscles that the patient is really deformed. The latissimus dorsi and infra-spinatus are especially likely to show excessive enlargement, and when these muscles are considerably increased in size the deformity is twice noticeable than when the leg muscles are the seat of the muscular growth.

As may be inferred from the nature of the process, instead of there being increase of strength in proportion to the increase of size of the legs they are rendered very much weaker, it being with difficulty that the child can rise from a sitting posture, climb stairs, or do other acts common to children of its years. The flexors of the hip are always sufferers from a loss of power, and the extensors of the hip and knee are generally weakened. On account of this weakness of the muscular system the attitude of the patient is peculiar. While standing erect the center of gravity of the body falls slightly in front of the point of support, and the hip and knee joints are not in a position of complete extension. In order to maintain its equilibrium the child has to support itself by a strained action of the erector-spinae and the extensors of the hip and knee. The upper part of the body is thrown backward to compensate for this deviation from the normal gravity of the lower part of the body and legs, giving an increased lumbar curve and forward protrusion of the chest and abdomen. A careless observer may mistake this attitude with that of kyphosis.

Perhaps the most peculiar feature of the muscular movement of the hypertrophic child is seen in its efforts to rise from the recumbent posture. As described by Gowers the patient has not sufficient power to extend the knees when the weight of the trunk is on the upper extremity of the femur, which is then a lever with the power applied between the fulcrum and the weight, acting to least advantage. The child places his hands on his knees and thus brings much of his weight on the upper part of the trunk on the femur close to the fulcrum, between this and the power; it can then act to a greater advantage; the weight of the head which is in front of the arms tends also to aid the extension. (Fig. 47.)



FIG. 47.

When the knees are extended the power of the extensors of the hips may be sufficient to raise the body into an upright pos-

tion. If, however, these extensors are weak the hands are moved higher and higher up the thighs, grasping alternately, and thus pushing the trunk upward to give the necessary support for this act. The knees must be not quite extended, and if the extensor muscles have not power the patient is altogether unable to rise. When the extension of the hip is easier the patient may accomplish extension of the knees in another way. He



FIG. 48.

puts his hands on the ground, stretches his legs far apart behind him, and rests the chief weight of his body on his hands. Keeping his toes on the ground and pushing the body backward by the hands he manages to keep the hands extended until the trunk is supported by the hands and feet, the first as widely apart as possible. Then the hands are moved alternately along the ground backwards so as to bring a larger portion of the weight of the trunk upon the legs. One hand is then placed upon the knee, with the other hand on the ground,

and a push is made with the hand on the knee enabling the extensors of the hip to bring the trunk into an upright position. (Fig. 48.)

Diagnosis.—Quite independent of the enlargements belonging to pseudo-hypertrophic paralysis this peculiar maneuver on the part of the patient in efforts to rise from the recumbent position is sufficient to diagnose this special form of muscular paralysis. In the late stages deformities occur, at the joints especially, and the wasting and the contracture may be so severe as to cause an exaggerated degree of curvature of the spine. The ankle, knee, hip and shoulder may all be involved in contracture and antero-posterior spinal curvature, due to weakness of the hip and knee, in consequence of which the pelvis is pulled upward and forward, carrying with it the lower lumbar vertebrae.

The electrical irritability of the muscles is not altered until pronounced weakness or wasting has set in. The knee-jerk may at first be normal, but as the extensors become feeble it is loosened and disappears. The functions are not involved nor are the sphincters affected in the majority of cases. The mental development of hypertrophic children is generally better than other children of the same age, and the functions of the nervous system are usually normal.

The course of this form of paralysis is usually slow. Its progress may continue slowly but gradually over ten or a dozen years, when, in consequence of increase of weakness, the patient

ceases to walk and the muscular disease makes more rapid progress. The deformities increase as the contractures of individual muscles increase. Death is rarely due to the pathological lesions belonging to this form of paralysis, but lessened respiratory power results in chest affections, and pneumonia, bronchitis, or chronic lung disease often supervene. The course of the disease is slower in girls than in boys, and the female sex furnishes a relatively larger proportion of the prolonged cases. Patients may drag along over a good many years with moderate hypertrophic paralysis, and then suddenly develop a rapid increase in all the symptoms.

Etiology.—This disease is looked upon as a congenital affection. Hereditary influences may be traced in a large proportion of cases, exclusively from the mother. Even when it occurs quite late in life it is believed the defective muscular development has existed from the earlier years. It has not been traced to syphilis or alcoholism, and the opinion long held was that it was a disease of nervous origin; but this idea has been abandoned by pathologists, and it is now considered that it is primarily a disease of the muscles and is recognized as a form of type of a group of myopathic atrophies.

The initial feature of the disease is the degenerative change that occurs in the muscular tissue. Sections of living muscles show atrophy of individual fibres, even to complete wasting. A phenomenal increase in the muscular fibres is an especial feature of the disease. In these is shown a splitting in the elastic fibres and the forming of vacuoles in their interior. The connective tissue shows proliferation until it becomes excessively developed. It is crowded with fatty cells, and it is to this condition that the muscles owe their unusual hardness and increased volume. The nervous system shows no particular lesion, but it is suggested that the unnatural development of the muscular tissue, and the pathological changes that have been seen to belong to them, depend in some way upon functional disturbances of the cord that are not yet fully understood.

Treatment.—In a general way the treatment of pseudo-hypertrophic paralysis will rest upon efforts to so support and sustain the general health that nature will have the best possible conditions afforded her upon which to offer resistance to the progress of the disease. Perfect hygiene, supportive food, regularity of exercise and fresh air, change of climate if necessary, and general manipulation of affected muscles will constitute the management of this disease.

In the line of medication it is best to subject the hypertrophic child to a course of constitutional homeopathic treatment based upon the family history and the constitution and temperament of the child. In all lesions of this character there is something

wrong with that subtle element in human existence known as the vital force, and while it is very difficult to understand just what may be the character of the disturbance it has been so often proven clinically possible to uproot constitutional tendencies that a well directed course of constitutional remedies, as *Arsenicum*, *Sulphur*, *Calcarea*, *Phosphorus* and *Silica* should be instituted in the hope of so starting up the retrograding powers of nature that they may be able to resist the progress of the symptoms belonging to this myopathic disturbance.

I should expect to secure good results from the tissue remedies, especially *Kali phosphoricum* and *Kali muriaticum*. *Kali muriaticum* is found in the blood corpuscles, muscle cells and in the nerve and brain cells, as also in the intercellular parts, while *Kali phosphoricum* is a constituent of all natural tissues, notably brain, nerve, muscle and blood cells; and while the latter remedy is more especially suited to conditions arising from want of nerve power, and to neurasthenic states, yet it has its bearing upon muscular atrophies, and retards the nutrition resulting from degeneration of involved nerves, and since both these remedies enter into the composition of the muscle-salts it seems reasonable that they should have some influence in arresting the progress of unusual disturbance in these tissues, even though there be the excess of hypertrophy or the deficiency of atrophy.

Phosphorus, *Zincum*, *Aluminium*, *Platina*, *Gelsemium*, *Cuprum*, and other remedies suited to paralytic states and contractures will be naturally thought of in association with infantile paralysis and the deformities belonging to this type of disease.

CHAPTER XLIV.

EPILEPSY.

General Considerations—Types—Le Grand Mal—Le Petit Mal—Symptoms and Course—Diagnosis—Prognosis—Treatment.

General Considerations.—Epilepsy is among the commonest of the profound nervous disorders of children. The name is made to apply to the convulsions that depend upon certain organic brain lesions. Convulsions very much like those of epilepsy are due to tumors and abscesses of the brain, and are attendant upon certain acute diseases, as cerebro-spinal fever, pneumonia in children and certain of the exanthemata; but while the convulsions of the diseases may be epileptoid in character they are in no sense epileptic seizures. The latter are due to cortical lesions and follow a

chronic course. They are influenced by heredity, age, sex, mechanical injuries, certain diseased conditions of the brain and spinal cord and irritation of the cortical substance. Seizures very like epilepsy and difficult to differentiate from the true disease depend also upon hysteria and various extreme neuroses. It is very hard to discover the lesions that cause epilepsy, it seeming to be dependent upon a certain degree of irritability either of the nerve centers of nerve cells, or upon an unstable state of the nervous system generally.

That it is influenced by heredity is evidenced in the fact that it is seen in child-life in the children of subjects of hysteric insanity, of violent headache, and perhaps of alcoholic or other nerve-degeneration habit. It is seen in families in successive generations. Gowers recites the occurrence of fourteen cases in one family tree in the course of four generations. It is much more commonly seen in children than in adults, about one-sixth of the cases occurring under four years of age. It has been found that this disease carries in marked measure the blight of hereditary impression. The children of mothers who are choreic, and of fathers who are debauchees, form excellent material for the development of epilepsy. It is rarely seen to commence after the twentieth year of age, except from traumatism; thus again showing its relation to hereditary influences, since it is quite the rule for diseases depending upon hereditary to develop prior to maturity.

Epilepsy is seen in about equal frequency in the two sexes, with a possible majority of cases belonging to girls. It is influenced by the question of sexual life to that extent that epileptic subjects are often worse, that is, they experience more seizures at or about puberty. The disease is often excited by injury. Severe blows or falls upon the head, with or without depression of the cranial table, are known to produce convulsions which recur with regularity, although not before seen. It sometimes follows upon irritation of the spinal cord and also by continued irritation of the cortical substances.

Epilepsy in infancy is seen much more commonly in the subjects of rickets, and during the period of dentition. Convulsions occurring at this time of life are often ascribed to other causes, as the teething process, severe indigestion, and sharp exhibition of simple fever. They are commonly associated with the specific fevers, especially scarlatina, and occur also in association with the recession of the eruption of any of the exanthemata. Besides rickets, constitutional syphilis seems to predispose to epilepsy; and the children of parents who have used alcohol and tobacco to excess are more commonly subjects of it than children of parents whose nervous systems have not been brought under the degenerative influence of these noxious substances. Sexual excesses

and onanism are associated with epilepsy, and were formally considered to be one of the commonest causes; it is now believed, however, that these are as much the result of the brain irritation that results in epileptic attacks as the cause of its manifestations. The children of sexual debauchees, and those who have suffered sexual diseases and debilities, are much more likely to be afflicted with epilepsy than the children of parents who have followed sexual hygiene.

Types.—Epilepsy shows itself in two distinct forms. One is *le grand mal* and the other *le petit mal*.

LE GRAND MAL.—The major form of the disease is far more common than the minor, or at least our attention is more commonly directed toward it by the violence of the seizures. Attacks are generally preceded by a certain degree of consciousness of their approach that is described as an aura. This is not present in all cases, but when expressed is described as a peculiar sensation of depression preceeding the convulsions, affecting the special senses and nerve centers and vaso-motor nerves. The sensitive system is affected by pain, excessive sensibility, or benumbed sensation in some part of the body. It is often the extremities, and may be especially located in some part, as the thumb or great toe. In many children it is felt in the epigastrium, and the conviction is created in the mind of the parent that the child is suffering from worms. In subjects old enough to describe the aura it is explained as a sensation of numbness, immediately followed by a wave-like sensation, extending from the benumbed part upward over the entire body. This aura was described by Galen as the cool breath or cold wave sweeping to the brain. In children its presence is often manifested by fright; the child seems to appreciate the oncoming of the spasm and cries out or utters a guttural noise, or tries to run to its parent or take hold of something to sustain itself, but falls in a convulsion. The aura of the vaso-motor system is shown by local congestion of blood to the surface, with mottling of the integument and purplishness of the face, or by extreme pallor of the countenance immediately preceding the convulsive attack. The motor aura is distinguished by jerking and twitching of the muscles, individual muscles or groups of muscles showing in grimaces, by blinkings of the eyes, and sometimes by spasms of the extremities, with contortions of the neck, head and shoulders. The special senses are also possessed of aura, as described by older epileptic subjects. Flashes of lightning, sparks of light, or brilliant display of colors, especially of red, occur before the eyes, while noises like the rumbling of a train at a distance, or far away thunder are heard just before the attack. Children who have had repeated attacks, and who have been hurt in falling will involuntarily sink to the floor as the aura comes on, unless they are too frightened or the attack is too quick for them. The parents, play-

mates and nurses of epileptic children learn to interpret the symptoms of aura and quickly recognize the oncoming of epileptic spasms. In older subjects it will be sometimes noticed that there is a prodromal stage of a number of days. The child is gloomy, reticent, and suspicious, or perhaps quarrelsome and vehement. He may experience headache, drowsiness, and occasional mental convulsions, from which he reacts only to go through the same symptoms in exaggerated degree within a day or two following, and to then go through a regular epileptic seizure from which he recovers to be better than before the prodroma.

In cases in which no aura is expressed it is believed that it is because of the violence of the attacks that it is not felt. The shock to the nervous system is so sudden that the patient falls immediately in convulsions instead of experiencing short-lived prodromata. The form thus described is known as the major form of epilepsy or *le grand mal*.

LE PETIT MAL.—This name is applied to the milder form of the disease, in contra-distinction to the severe type. The patient is the subject of vertigo or actual loss of consciousness for an instant. There may be muscular contractions and seizures that appear to be lightly epileptic in character, but neither profound tonic or clonic spasms follow. These are walking cases of epilepsy and never fall in a fit, but by steadying themselves for an instant, regain consciousness, the vertigo ceases, and but for a temporary feeling of sickness and headache, and perhaps a disposition to drowsiness, the patient is not rendered severely unwell.

Symptoms and Course.—While the auras which have just been described are a part of the general course of epilepsy yet it is the convulsions that most concern the physician, the family and the patient. With the exception of the premonition belonging to the aura, which is usually of exceptionally short duration, although it may be prodromal as suggested, the epileptic seizures occur with extreme suddenness. The child may be at play or at its meal or asleep, when, without previous warning, it will utter the peculiar epileptic cry which is as characteristic as the *cri hydrencephalique*, although altogether different. It is a peculiar intermingling of half-animal and half-human groan. The patient is usually not aware that he utters this cry, a more or less complete degree of unconsciousness having been its cause. Adults and youths occasionally say they are able to recollect having attempted to cry out, even realizing that they had made an effort to call out for help with no success; while again it is not remembered that any attempt was made. As the epileptic groan is uttered the child will fall in its tracks wherever it may happen to be and immediately pass into a convulsion; in fact the convulsion has already set in, and instead of the noise that is uttered being a call for help it is often nothing more nor less than a forcible expiration of air from

the lungs and throat already involved in convulsions. Epileptic subjects usually fall on their face, more often than on their sides or backs, though in some cases they will fall backward with sufficient force to cause severe concussion of the brain, which adds to the gravity of the situation. Tonic spasm of all the muscles immediately occurs, with complete loss of consciousness as the patient falls. Respiration is arrested, and the pupils are widely dilated. The facial muscles twitch and make horrid grimaces; the jaws work, and perhaps the tongue protrudes and is frightfully bitten. Owing to the spasms of the chest muscles and continued spasmodic efforts at expiration the patient becomes cyanotic from general carbonic acid poisoning, the pulse is hard and throbbing, and very much slower in its action than in normal condition, unconsciousness is complete, and general clonic convulsions that shake the whole frame, with jerkings and twitching of the body, immediately set in. The initial stage next following the aura, covered by the epileptic groan and tonic convulsion, lasts from a few seconds to a half minute or minute, being immediately followed by severe clonic convulsions which may last from half a minute to eight or ten minutes, and in unusually severe cases much longer.

With the quieting down of the convulsion partial consciousness may return, or the child may fall off into an exhausted sleep for some time, arousing still exhausted and wondering what has happened; hard headache, pain of the muscular system from the convulsion, with more or less of bruising as a result of the spasms, then supervene. If consciousness return speedily, or if the child comes out of the convulsion into immediate consciousness, it is apt to show exhaustion and distortion of the eyes and face; the eyes are red and swollen, the respiration is more irregular, but not alarmingly so, the pulse is rapid and irritable and the skin may be bathed in moisture; or the seizure may be immediately followed by elevation of the temperature with febrile symptoms. Frothing and foaming at the mouth, with copious discharge of mucus, occur during the violence of the attack, the excessive salivation continuing for some little time; so that the first efforts of the child upon regaining consciousness are to clear its throat of mucus and rub its eyes and attempt to arouse from the coma which follows the seizure.

The times and frequency of the recurrences of epileptic seizures are exceedingly variable. As a rule the attacks are single, but there are exceptions in which a number of fits occur in one day. It is not often that they occur on successive days. They are more frequent on the lunar cycle, but in many subjects have a periodicity of about seven days. In girls the approach of menstruation does not materially influence the frequency of attacks. In a general way the approach of puberty has a bearing upon epilepsy in youths of both sexes who have been subject to epilepsy

earlier, both showing either marked improvement at this epoch of life or becoming worse. In other cases epilepsy is developed for the first time at or about the age of puberty in subjects who have been choreic or hysterical from infancy or early years.

Diagnosis.—It is not always easy to diagnose epileptic spasms. The convulsions have very much the same general character as those occurring with hysteria, uremia, dentition, with tumors of the brain and from apoplexy, opium or alcoholic poison. There is a form of fit that is practiced by impostors that very closely resembles epilepsy, but this is not usually witnessed until in later life, the diagnostic sign in such cases being a lack of dilation of the pupils and the rapidity with which the patient recovers if it is proposed to test the verity of the spasm by the application of a hot iron. It is not often that children practice imposition in this direction, yet it is done by youths. Hysterical convulsions are associated with previous hysterical habit. There is no dilation of the pupils in these convulsions, nor do subjects bite the tongue and asphyxiate as in epilepsy. They are more common to the female sex, though not limited to girls. Spasms of dentition are usually associated with fevers, but consciousness is not lost so easily in these spasms as with epilepsy nor do the convulsions result in stupor or paralysis as does epilepsy. The presence of the teething process as a factor and the previous history of gastro-intestinal disturbances, which are nearly always present, the preliminary threatenings of the convulsions, the prompt restorations of consciousness, and the removal of the exciting cause, if it be indigestion or over-loading of the stomach that has instituted the attack, will assist in determining its cure. With apoplexy there is generally one-sided paralysis; one pupil is dilated and the other contracted, while in epilepsy both pupils are generally dilated to their fullest extent. The convulsions of uremia are preceded by a history of kidney disease and the coma is not so profound; nor is the breathing interfered with so pronouncedly by spasms of the thorax and throat as with epileptic seizures. In epilepsy the face is purple, the eyes injected and the patient foams at the mouth, while in the convulsions of uremia the face is generally pale or waxy and perhaps puffy. The heavy breathing of opium poisoning and its degree of unconsciousness are very like those of epilepsy, but in opium the pupils are contracted as small as pin points, and if aroused the patient falls back into stupor immediately. If convulsions from alcohol are seen in children or in youths the odor of alcohol will reveal the character of the spasm. Furthermore the tongue is not likely to be bitten and the pupils are not dilated as in epilepsy.

Most convulsions occurring in child-life are from the teething process, from acute fevers or from suppression of eruptions; yet it has been shown that epilepsy occurs during the first five years of

child-life in about one-sixth of the entire number of epileptic subjects, hence the importance of considering this disease in connection with all spasms of childhood not certainly and directly dependent upon acute febrile disorders and suppressed eruptions. It should be remembered also that the epileptic tendency may account for the occurrence of convulsions during the course of acute diseases. The occasional recurrence of epileptic seizures without association with specific disease in children should make the diagnosis of true epilepsy not difficult.

Prognosis.—Epilepsy is among the stubborn diseases we are called upon to treat. Cures of true epilepsy are rare, and when the disease has assumed chronicity, that is, when it has become seated and the child is subject to repeated attacks, the prospect of recovery is not bright. *Petit mal* responds to proper treatment in a majority of cases. The more severe the spasms and the more frequent their occurrence in *grand mal* the less the possibility of cure. If the disease be taken early and its cause be diligently sought good results may be hoped for in children whose seizures are not too violent or frequent. I believe it to be due in a great many cases in child-life to constitutional taints which may be uprooted, in good measure at least, by the faithful exhibition of antispasmodic remedies. It is not to be wondered at that there is little encouragement in old school practice, their treatment resting largely upon crude and palliative medication.

Treatment.—In order to be permanently effective treatment will have to be directed toward the constitution. There is no opportunity to treat the aura except in those cases in which there are initial symptoms of irritability, vehemence and other mental perturbations, extending over a few days prior to the active paroxysms, as is sometimes, though rarely, witnessed. If the physician has charge of an epileptic child who shows this prodrome it is possible, in individual cases, to at least modify the paroxysms and sometimes to avert them; but as a rule the aura is so sudden that nothing can be done in the way of warning off the attack. The treatment at this time will consist of the exercise of care to see that the child is not injured during the violence of the convulsions, by being thrown forcibly against the floor or otherwise injuring itself. It is well to protect the tongue, also, by gently forcing some firm substance between the teeth. Nothing can be accomplished in the way of medication at this time. The basic treatment of epilepsy will be directed toward the uprooting of the *dyscrasia* upon which it is founded.

Here, in child-life, *Calcareo* comes in as of first importance. It is not always easy to individualize its symptomatology, and it is prescribed in rather empiric manner for the general constitutional state of the subject. *Calcareo* children are predisposed to rickets, have difficult teething, summer complaints during infancy, flab-

hiness of the muscles, large heads, open fontanelles and distended abdomens. It is more than ever useful if there is the tubercular habit behind the case. The child having *Calcareo* relaxation upon falling asleep, with sweating about the head and neck. The aura is first felt in the solar plexus and extends upward like a wave over the body. Nightly attacks of epilepsy, worse at the full of the moon, enfeebled memory and dullness of intellect, with general languor and nervous debility, in epileptic children call for *Calcareo*.

Sulphur will be found an excellent basic remedy in the chronic epilepsy of children, their convulsions being attended by soporose sleep and great exhaustion. Constitutional dyscrasie depending upon suppression of eruptions or tubercular diathesis call for *Sulphur*. The occasional exhibition of this remedy, extending over a period of many months in early life, is capable of good results with epileptic children. It should be prescribed for the *Sulphur* state of the system.

Kali carbonicum is closely akin to *Calcareo* in its constitutional picture; the *Kali* child is of drier texture and skin than the *Calcareo* child, with more of tendency to scurfing and unhealthiness of the hair and nails. The spasms are attended by paralytic debility, and occur in the early hours of the morning.

Kali bromatum is an excellent remedy for the modification of epileptic attacks, but is hardly among the curative medicines. In full dose it is the chief reliance of antipathic practice. It has mental dullness, slowness of expression, heat in the head, languor, reeling, uncertain gait, the patient being morose, indifferent and sleepy. The prophylactic administration of *Kali bromatum* when this picture presents, and also when exactly the opposite presents as a state of nervous sensibility, in the lower attenuations may avert the seizure or modify its severity.

Cuprum is among the most curative of remedies in epilepsy in child-life. In idiopathic epilepsy occurring in the child, the aura beginning in the lower extremities, the convulsions being attended by foaming at the mouth and unconsciousness as soon as the aura reaches the hypogastrium, *Cuprum* is called for. The convulsions recur at regular monthly intervals; convulsions commencing in the toes, with clenching of the thumbs and spasms of the thorax, causing suffocation. Extremely violent convulsions that are long continued call for *Cuprum*. There is present extreme lividity or equally extreme paleness of countenance, with coldness of the hands and feet and feeble heart action. The aura is of rather long duration. Patient amorose an instant or two before the paroxysm or oncoming of a seizure.

Stramonium is especially adapted to epilepsies starting from the splanchinic system; convulsions radiating from the sentient and motor nerves of the spinal system, finally reaching the brain. Well

defined polarity continues some time after the attack. *Fluobum* is better suited to cases of long duration, to epilepsy from cerebral sclerosis or tumors. Heaviness of the legs, and unstable gait, preceding and following convulsions. *Fluobum* children are severely constipated, and are the subjects of pains in the epigastrium.

Silica.—This remedy is classed with *Calcarea* and *Sulphur* as curative in constitutional states upon which epilepsy engrafts itself. Nightly attacks occurring about the time of the new moon. Chronic epilepsy; feeling of coldness in the left side of the body; left side involved in the paralytic weakness; exalted sensibility followed by nervous debility. Useful in inveterate cases and especially after *Calcarea*.

Nux vomica will be found an excellent remedy in mild epileptic seizures following upon indigestion. Severe spinal epilepsy with opisthotonos. Firm rigidity of the limbs, with trembling, convulsive twitchings.

Ipsachia is better suited to cases of recent incipency; epilepsy occurring from emotional causes, especially grief. Patient despondent and morose. Child sits in a silent, stupid state. Is especially adapted to the hysteriform convulsive attacks of young girls.

Digitalis has been found more adapted to nocturnal epilepsy. Epileptic attacks occurring from seminal debility. Nightly emissions. Weak heart action. Repeated attacks of vertigo in young subject call for *Digitalis*. It will be found beneficial in epilepsy resulting from sexual neuroses of child-life when such are present.

Rana bufo.—This remedy is recommended by a number of observers as suited to epilepsy in which the aura starts from the sexual organs or from the solar plexus and to epilepsy as the result of masturbation. Epileptic convulsions occurring during sexual excitements. Severe cases in children, with the head drawn backward. Spasms come on with sharp, piercing cries; it is characteristic of severe clonic and tonic spasms.

Besides these remedies *Hydrargyric acid* is sometimes beneficial in recent cases characterized by violent convulsions, great exhibition of prostration and chronic indisposition to work or inability to perform any duty. Children are disinclined to play and take but little interest in anything. *Lachesis* meets cases in which the aura is more complained of in the cardiac region. *Oenanthe* has proven beneficial in nightly epilepsy; *Platina* in hysterical epilepsy; *Glaucinum* in cases caused by intense heat. *Gelsemium* suits hysterical epilepsy after suppressed menstruation, and *Cimicifuga* is especially applicable to hysterical convulsions occurring during the approach of menstruation in young girls. *Cannabis* and *Cantharides* are occasionally useful for the hysterical variety. *Argentum nitricum* has aura for a number of days or

hours before the attack, during which the pupils will be widely dilated, and the patient gloomy and dull. *Cicuta*, *Belladonna*, *Aethusa*, *Capsura aculeata*, *Opium* and *Zincum* are also occasionally applicable to the convulsions of epilepsy, if sufficient warning be given to permit their use.

To be successful treatment must be directed toward the constitutional state. This forms the basis of success. Next, remedies should be administered with reference to modifying or aborting the spasm if the aura is of sufficient duration to admit of this possibility. And, finally, remedies will have to be applied for the after effects, as headache, paralytic states, injuries to the brain from congestion and concussion, and the general ill-effects of epileptic attacks.

SECTION V. DISEASES OF THE DIGESTIVE ORGANS.

CHAPTER XLV. DISEASES OF THE MOUTH.

General Considerations—Catarrhal Stomatitis—Symptoms of Catarrhal Stomatitis—Aphthous Stomatitis—Symptoms of Aphthous Stomatitis—Stomatitis Mycose—Thrush—Symptoms—Ulcerative Stomatitis—Noma—Stomatitis Diphtheritica—Symptoms of Stomatitis Diphtheritica—Syphilitic Stomatitis—Gonorrheal Stomatitis—Treatment.

General Considerations.—Infants are much more subject to diseases of the mouth than adults. The latter are largely subjected to affections depending upon diseased teeth and syphilis, while in infant life there are a number of disorders dependent upon conditions of the stomach as well as upon teething and upon syphilis, scurvy and other constitutional states. Children's mouths are also rendered subject to disease by the introduction of bacteria from without and, it is believed, by diseases contracted from the maternal nipple. In a general way, not enough attention is paid to the infantile mouth. Now that it is understood that injuries to the tongue and buccal membranes arise from the use of the rubber nipple, in artificially fed babies, from various bacteria and from putrefactive changes from particles of food retained in the mouth, it will be seen that the frequent cleansing of the tongue, lips and gums in infancy with sterilized water should be a part of the infant's daily attention. Rough attempts at cleansing are sometimes the cause of trouble when the gums are sore, and not infrequently the presence of a diseased tooth will cause a good deal of microbial disease-manifestation. While not necessary to use mouth antiseptics with young children very often, such as *permanganate of potash*, *chlorate of potash* or *boric acid*, it is desirable to keep the oral cavity as clean and wholesome and sweet as possible, especially whenever disease of that organ is present. For this, perhaps, one of the best local applications I have ever used is a weak solution of *Calendula* applied in very young children on soft linen cloth, in older children by insisting upon their swishing it about the mouth and ejecting it.

Catarrhal inflammations of the mouth very often depend upon conditions of the gastric ferment and inflammation of the stomach, as also upon pneumonia, bronchitis and diseases of the mucous membrane of the pharynx, esophagus and windpipe. The classified diseases of the mouth are catarrhal stomatitis, aphthous stomatitis, stomatitis mycosa, ulcerative stomatitis, gangrenous stomatitis and the stomatitis belonging to the various forms of eruptive diseases and to syphilis. These may vary in severity from the simplest manifestations of catarrhal inflammation to destructive and even fatal gangrene.

Cases of stomatitis commencing with tiny spots called epithelial pearls have been reported. In an epidemic occurring in Maternity Hospital on Blackwell's Island, during the service of Dr. Garrigues, fifty-seven cases were reported in which the disease manifested itself by the appearance of a small, white speck at the junction of the right tonsil and palate, followed later by extension of the disease from the median line to the spot upon which the pearls first appeared. These consist of minute globules, varying in size from a pin head to a millet seed. They are imbedded in the mucous membrane, are composed of epithelial cells and require no treatment.

Catarrhal Stomatitis.—Catarrhal inflammation of the mouth may be a wholly primary ailment. It is most commonly seen in bottle-fed babies and its irritating cause may be mechanical, as from injuries arising from the rubber nipple on the teeth, or it may be from heat, as from over-hot food; or it may arise from chemical causes, as from chemical changes occurring in the food, or from toxins generated in particles retained in the mouth. Lack of cleanliness of the mouth is the most common cause of catarrhal stomatitis, although it may be possible to superinduce the disease by injury to the membrane of the mouth from excessive effort in this direction. This disease is nearly always the forerunner of other forms of mouth inflammation, it being rare for malignant oral disease to occur without previous general simple inflammation. It is not impossible that changes in the chemistry of the mouth-ferments may have to do with its causation in individual instances, and it attends also upon the simple adenitis common to young children, although it is believed that the latter is secondary to the former rather than the reverse.

SYMPTOMS.—Stomatitis of this variety makes its appearance during the first year of life. The initial symptom is pain. The child nursing the nipple or the bottle will discontinue its efforts and cry; repeated trials will be made with more or less pain attendant upon each. The mechanical irritation of sucking is excessively painful in some cases. Upon dropping the nipple the child will direct attention to its mouth by stuffing its fingers therein and undertaking to nurse upon them. The saliva is increased in

quantity, the mouth feels hot; occasionally the salivary secretion is less than it should be and the glands, especially the sublingual, are swollen, tender and hot; the mucous membrane of the mouth shows hyperemia and as the disease progresses becomes dark in color. Occasionally patches of intense redness are seen inside the cheek, on the gums, or hard palate; the roof of the mouth looks as if almost blistered with hot liquid. The child is fretful and peevish and shows slight fever. In acute cases of considerable severity the temperature rises to 103° or 104° even. The tongue is usually coated, white at first and later rather yellowish in color, and as its coating disappears it is left patched and mottled. Sometimes it is red, but not of the characteristic appearance of scarlet fever tongue.

The stomatitis attendant upon whooping cough or measles shows to be darker in color, more of a bluish tint, while in scarlet fever the mouth is red and the eruption appears in places almost as characteristic as upon the skin. The measles eruption is seen in the mouth for some hours or a day before its development upon the integument, and when present the mucous membrane will be swollen and dark, will be tender to touch, and the nursing, if the child be nursing, will be painful. The lymphatic glands are nearly always involved even in simple stomatitis, the degree of involvement being usually proportionate to the severity of the case. In rare instances salivation is excessive, the glands pouring forth their fluid in abundance, causing excoriation of the corners of the mouth and of the integument of the skin.

Aphthous Stomatitis.—This variety is differentiated from the simple by greater intensity of inflammation and by the presence of patches of varying color upon the buccal membrane and tongue. It occurs in older children as well as in nursing infants. The aphthae amount to an eruption or ulceration of the superficial layers of mucous membrane. This form of the disease, commonly known as "mapped mouth" is most in evidence toward the end of the first year and does not seem to be associated closely with the teething process. It is frequently seen in connection with gastro-intestinal catarrh and the acute eruptive diseases, and is accounted similar in its etiology and course to herpetic erythema. It is seen oftentimes in a number of children in the same family, either at the same time or successively. (Fig. I. Plate IV.)

Symptoms.—Aphthous stomatitis is preceded by the simple form of the trouble; or it may commence with gastric manifestations, as nausea and vomiting, the case presenting at once the symptoms of an acute disease. The mouth quickly becomes sore, the fever is pronounced and the lymphatics of the mouth and vicinity early show considerable enlargement. Examination will reveal whitish spots here and there over the mucous membrane or upon the tonsils, and within twenty-four hours white eruptive

spots, occurring singly or in groups, surrounded by a reddish areola, appear anywhere in the mouth, even to showing as a general eruption over the whole mucous surface. The fever usually corresponds to the intensity of the eruption, and twelve to thirty-six hours after its first appearance the superficial layer of the membrane will be softened away, as it were, and patches of the tongue and buccal membranes will be denuded, with sharply defined edges surrounding what is termed the aphthous ulcer. The course of the disease covers one or two weeks. Herpes frequently appear about the lips and nose; sometimes the patches in the mouth are decidedly yellowish in color. In more acute cases the soreness is quite severe and nourishment is taken with difficulty. There is much more pain than occurs in the simple form of the disease. It lasts longer and the constitutional symptoms are more pronounced. If occurring in connection with artificial feeding there will nearly always be diarrhea, while the child's mouth will be intensely red and studded with whitish or yellowish eruptive spots.

The aphthous ulcer must not be confounded with the mucous patches of syphilis, nor will it be except through gross carelessness. Nor should it be confused with Bedner's plaques, which are two white aphthous patches situated on the hard palate, one on either side, and due to the pressure of the tongue upon the roof of the mouth in the nursing act.

Stomatitis Mycosa.—Thrush is one of the most common of the infantile buccal ailments, and seems to be due to a specific micro-organism or fungus, a species of cryptogam. This form of the disease is most common in infants a few months old and is usually seen in connection with disturbances of the gastro-intestinal tract. It is especially common to bottle-fed babies, being a frequent attendant upon infantile atrophy and other wasting diseases. The fungus which causes it, or which at least is invariably associated with it, may be classed as a *saccharomyces*. It is found upon any mucous membrane in the body, and even in the parenchyma of the brain and lungs and in the blood vessels. It is held to be invariably introduced by means of the nipple of the nursing bottle, but finds lodgment or creates trouble only with children who are already debilitated or possessed of transmitted soil favorable to tuberculosis, rachitis or syphilis; nor is it likely that it ever presents as a strictly primary affection, being almost always found upon mucous membrane already showing catarrhal atmosphere. Children whose mouths have been bruised in nursing harsh nipples, or whose epithelia has been pinched by the rubber of the bottle nipple, are more likely to suffer from the development of thrush because of these mechanical injuries. Young children and those suffering from any of the wasting disorders are much more likely to be the subjects of stomatitis mycosa.



FIG. 1.
GANGRENOUS STOMATITIS.



FIG. 2.
ULCERATIVE STOMATITIS.

although it occurs also in older children in whom tuberculosis, especially tubercular meningitis, typhoid fever or pneumonia is present. The disease exists not only in the mouth but may extend downward to the larynx, esophagus and stomach, and I am quite sure I have witnessed severe gastro-intestinal ailments following upon sudden subsidence or perhaps migration of this form of aphthæ.

Symptoms.—Stomatitis mycosea is possessed of or accompanied by the symptoms belonging to the catarrhal form of stomatitis, the same as with all the classifications of mouth inflammation, the first diagnostic symptoms which present themselves being the pimply points, usually elevated above the surface of the mucous membrane, and of a grayish white or creamy color, first appearing upon the tongue and cheeks and later upon the lips and soft palate. These show as minute white, distinctly raised, individual points or scattered patches over the mucous membrane, looking like the flocculi of milk but not easily detachable from the membrane. In mild cases there are not many of these thrush points, but in severe ones they become so general as to cover the entire mucous membrane. Not always very painful these are cases in which the mouth, especially in young children, will suffer extensive inflammation in connection with the presence of thrush, and nursing will simply be impossible. In private practice, among children who can be well cared for and supplied with proper food, and whose hygienic surroundings are of high order, the patients are not likely to suffer severely; whereas, on the other hand, in crowded tenement houses and in squalid surroundings, and also in very young children who are being artificially fed, stomatitis mycosea becomes a formidable disease and often terminates life by the development of distressing gastro-intestinal disorders. In these latter cases all the symptoms depending upon severe illness of the alimentary tract will be manifested by thrush; in others which receive prompt attention the difficulty will be purely local and is readily curable.

Ulcerative Stomatitis.—Stomatitis albuginea is characterized by the destruction of more or less extensive tissues of the mouth. It commences about the teeth, is never present when there are no teeth, and is most extensive about the gums. The area of destruction is sometimes very extensive, involving almost the entire buccal cavity. It usually occurs during dentition, especially in children of from five to ten years of age, is most commonly seen in those who are unhealthy, who live in unsanitary surroundings, who are of tuberculous or rickety constitution, and is also witnessed in connection with the severe infectious diseases of childhood or is directly attendant upon them for its etiology. During its initial stage the gums are pale, swollen and spongy and the breath foul; the salivary glands become swollen and indurated and

are very painful. In rare cases glossitis is seen, and not uncommonly one or both lips are very much inflamed and distended. As the disease progresses the gums bleed, those near the incisors or eye teeth of the lower jaw being the first usually to be affected. The glands are so swollen as to rise above the teeth and soon show the presence of irregular ulcers exposing the roots of the teeth, causing them to loosen and sometimes to fall away. The ulcerous cavities about the teeth fill with muco-purulent pus and decomposed blood, rendering the condition of the mouth exceedingly foul and offensive. The glandular enlargement results in an increased flow of saliva, which is fetid as it comes from the diseased gums and often excoherates the corners of the mouth and lips, adding to suffering already quite severe. The mouth is painful and with the ulcerative process there is fever, fretfulness and intense restlessness. Sleep is rendered almost impossible because of the hyper-secretion of mucus and saliva. Swallowing is rendered difficult by the lymphatic enlargement and pain, as also by the soreness and swelling of the mouth. Suppuration of the glandular structures rarely occurs during the height of the disease, but in duration remains, sometimes for weeks, after the mouth has altogether recovered. In unusually vicious cases, where the gums are raised from the teeth and pus is formed about their roots, caries of the alveola may follow. In other cases chronic osteomyelitis is set up, the child's general health suffers, the ulcerative process extends from the gums to the cheeks and cellular tissue, the mucous membranes show discoloration, even to purplishness, and portions of the maxilla are loosened. At this stage of the case the stench is disgusting and the condition of the child extremely pitiable. Commencing as simple ulceration of the gums close to the teeth the disease may become so extensive that the entire mouth will be filled with ulcers. (Fig. 2, Platell.)

It can be readily imagined that if the child is intensely rachitic or syphilitic the destructive processes are likely to be more extensive and intractable than in children not so predisposed. When the buccal membrane becomes seriously involved the cheek may be so contracted by ulcerative processes extending to the muscles as to result in permanent cicatrization. If the disease is allowed to go on untreated it becomes quite unmanageable and develops into a more malignant form known as stomatitis gangrenosa, whereas, on the other hand, if taken in time when the gums only are swollen and ulcerating, presenting the characteristic yellowish seam or broad band of yellow discoloration, due to the death of cellular tissue beneath the membrane, it is fairly amenable to treatment and the severer noma may be avoided.

Noma.—The gangrenous form of stomatitis, or gangrenous sore mouth, follows upon ulcerative stomatitis when the latter is neglected, and also occurs in connection with the presence of

erysipelas and gangrenous disease in hovels, squalid tenement houses and the general habitations of the poor. It never occurs as a primary disease but follows most commonly upon severe manifestation of measles and typhus fever, and also upon whooping cough, syphilis and scurvy. Intense degrees of mercurialization are also responsible, and, in perhaps the majority of cases, cause both the ulcerative and gangrenous varieties of stomatitis. *Noema* is properly a phlegmonous gangrene. The tissues involved in the process are first infiltrated and streptococci of various kinds are held to be in causative relation to it. Immediately surrounding the phlegmon, or initial death spot of the sore, will be a zone of infiltration something like the yellow seam of stomatitis ulcerosa. Next adjoining this is to be found an increase in the connective tissue, which is shown to be in very active cellular division and whose blood vessels are occupied by thrombi. The healthy tissue adjoins on the outer side of this. On the integumentary surface the cheek is swollen, shining, stiff and pale. Sometimes it is dark red and erysipelatous in character; but it is the destruction that is going on within the mouth that is productive of the gangrene. Pieces of maxillary bone that were loosened in the ulcerative are frequently destroyed in this variety. Areas of moderate ulceration become very much enlarged and the destructive process extends deeper into the tissues, death of the buccal surface occurring at the gangrenous spot. Necrotic extension into the infiltrated tissues adjoining increases its area until the whole cheek is involved in the process, perforation and destruction of the entire side of the face occurring, sometimes very quickly, even within twenty-four or forty-eight hours of the first appearance of the gangrenous state in the mouth. In desperate cases the gangrene ravages unchecked until the superior maxillary bone, the floor of the orbit, and portions of the nose are completely destroyed. The eye may be involved in the gangrenous destruction and, by the development of the profound constitutional condition of hectic exhaustion, suppuration of glandular structures and colliquative diarrhea death may ensue early. If the odor from ulcerative stomatitis is offensive that from gangrenous stomatitis is an hundred fold more so. The stench is simply intolerable in cases that have been neglected and that are not treated antiseptically, and even under the very best methods known to surgery it is still bad enough.

While all cases of gangrenous stomatitis are dangerous and difficult of treatment yet it is not always fatal. Spontaneous recovery is never seen, but under prompt and profound constitutional measures and antiseptic surgical treatment, if the constitutional condition of the patient be not too bad from syphilis or rachitis, it is possible that recovery may be secured. Even then severe relapses may occur and if death does not ensue from septic

pneumonia or exhaustion, from inability to take food, and from the drain upon the child's vitality, due to the extent of the suppuration and suffering. It may go through a long period of recurring manifestations of the disorder before recovery, even though with extensive oral and maxillary deformity, is secured. The case shown on the frontispiece, Fig. 1, Plate II, from the clinic of Dr. L. W. Thompson, at the Children's Hospital, Philadelphia, well illustrates the destructive process of gangrenous stomatitis. This case resulted fatally in spite of vigorous and well directed efforts at its cure.

Stomatitis Diphtheritica.—Diphtheria is attended by a stomatitis peculiar to itself, and is nothing more or less than the development of a diphtheritic membrane and diphtheritic process generally upon the buccal membranes, tongue and lips. The glands of the cheeks are not likely to be involved, the process seeming to be confined wholly to the mucous membranes. It is usually common to advanced stages of the general diphtheritic affection. This form of stomatitis may develop primarily upon the lips or mucous membranes of the mouth from infection from a case of diphtheria, provided any of these tissues suffer abrasion whereby the Klebs-Loeffler bacillus gains entrance. It must be borne in mind that the diphtheria germ has been found in mouths and throats that are healthy, having been inhaled from diphtheria patients. Should subjects in whom it is thus lodged present abrasions of the mucous tissues it can be readily understood that primary diphtheria might develop on these sites, the same as upon the vulva or the site of any surgical wound. The stomatitic feature of the case does not last long, however, as a separate condition, genuine diphtheria developing as soon as the bacillus and its toxins are sufficiently multiplied to involve the general system in the process. This form of stomatitis rarely occurs except in connection with diphtheria in a family or school, and so loses its primary feature, although it may run its course in so far as the mouth is concerned without being observed, attention being called to the condition by the subsequent development of diphtheritic septicemia from toxine or bacillar absorption.

SYMPTOMS.—The symptoms of stomatitis diphtheritica are the pressure of a membrane more or less dense upon some abraded site, either on the mucous surface of the lips, gums or cheek, with excessive salivation and fetid odor from the mouth. If limited to a local ailment there is not apt to be severe headache, fever or constitutional symptoms. In special instances sloughing of buccal membrane takes place and considerable hemorrhage may occur from destruction of blood vessels. This may also happen from the lips or gums. It is not believed that the invasion of the mouth by the diphtheritic process in cases manifesting the disease in the general way is deserving of classification among the stomatitis;

and, in fact, it is questioned whether the purely local manifestation of diphtheria in the mouth should be so classed, except, perhaps, for purposes of description as to locality. It bears none of the generic conditions and symptoms of the varieties of stomatitis proper, and is only considered in this connection because it is common to so classify it for the purpose of differentiating it from constitutional diphtheria with throat and subsequent mouth-membrane, and also to differentiate it from the severer forms of stomatitis that have already been described.

Syphilitic Stomatitis.—All the stages of syphilis are capable of development in the mouth. While not a common seat of chancres they are occasionally observed in this location, being contracted from syphilitic wet nurses and sometimes, in older subjects, from practices whose description does not pertain to this volume. In children they are rare. Not so, however, with the secondary manifestations of this disease. They are not only not uncommon, but, unfortunately, are too commonly seen, even among children of people occupying satisfactory social positions. Fissures, papules, plaques, erosions and patches are seen in and about the mouths of children of tender age. The rhagades occurring at the corners of the mouth are perhaps most common, and are one of the most certain evidences of inherited syphilis. At first at the site of these fissures there is syphilitic infiltration, with eventual cracking. If there have been pronounced cicatrices a certain degree of disfiguration of the mouth and face is likely to be the primary result. These oral rhagades and scars, together with the saw-tooth appearance of the temporary and eventually the permanent teeth, are among the confirming evidences of constitutional syphilis. Papules form at the free borders of the lips and also on the tongue; though these must not be mistaken for the patches belonging to ringworm and various rashes, nor for those common to some cases of chronic catarrh of the stomach. Nor should syphilitic appearances on the tongue and mouth be confounded with those belonging to the various local manifestations of aphthae of non-specific origin. Syphilitic lesions in the mouth are rarely destructive and not usually considerable in area. Primary sores may cause ulceration over a considerable extent, deep into the tongue or buccal surface, but these are not sufficiently common in infancy to be often seen.

Gonorrheal Stomatitis.—This disease is occasionally observed in the new-born. It shows by a yellowish-white discoloration on the roof of the mouth and tongue, the surrounding mucus being red, the affected portion showing as a white patch, thickening and becoming detached on the second or third day. Microscopic examination of the detached membrane, at the site of which pus is formed, reveals the presence of gonococci and pus cells. This form of stomatitis is due to local infection from the maternal vulva. Subjects of

it are prone to develop rheumatism and tonsillitis early in life if the local condition be not promptly cured.

Treatment.—As may readily be imagined the treatment of the various varieties of stomatitis which have been described must vary greatly. Simple inflammation of the oral tissues of the infant may require but simple measures for its relief, while gangrenous noma may be so virulent as to destroy life in spite of all that can be done. Ulcerative stomatitis, while not likely to be fatal, is often extensive in its destruction of tissue and ugly deformities arise because of it. Treatments, of necessity, have to be directed toward the cause of the ailment where syphilis is its origin, and diphtheritic stomatitis must be treated as diphtheria, with or without treatments commonly directed against constitutional septicemia, depending upon whether or no the system has been invaded by its poison. Gangrenous stomatitis will require active constitutional support and prompt, local surgical measures in indicative cases, together with rigid efforts at the exhibition of antiseptic treatment in order that the destructive process may be limited and life be saved.

MEDICATION.—Following the order in which the various classifications of stomatitis have been considered, attention will first be given to the treatment of the simple forms of the disease. *Aconite*, *Ferrum phosphoricum* and *Belladonna* will usually meet all the indications present in cases of simple inflammation of the mouth. The degree of restlessness, fever and general constitutional disturbance will differentiate the indications for these remedies. Careful cleansing of the mouth, as already suggested, with pure water or water medicated with *Calendula* or other bland medicament will assist in a speedy cure.

Aphthous stomatitis will require more direct application of constitutional remedies. Having commenced as simple inflammation the remedies already suggested will probably have been used before the thrush form of the disease is pronounced. If these have not been sufficient to promptly allay the inflammation it will go on to the development of the aphthous rash and other medicines may be needed. *Hydrastis* is one of the best of these. *Baptisia* also meets a large number of cases. *Aethusa cynapium*, *Nitric acid*, *Borax* and *Arsenicum* may have to be studied.

Hydrastis is especially beneficial in aphthous sore mouth; the tongue is heavily coated, and the mucous membrane is studded with follicular ulcers. Secretion of tenacious mucus from the mouth.

Baptisia is useful where the glands are ulcerated, dark red or purple, and there is a profuse flow of filthy saliva, offensive in odor. The tongue is sore, cracked and ulcerated, and the general systemic condition is that of this remedy.

Arsenicum covers livid and bluish aphthae, with blisters on the mouth and tongue, the thrush in the mouth and fauces being ex-

tensive. The child is restless, debilitated, emaciated. The general systemic picture is one of *Arsenicum* in a large proportion of cases of confirmed thrush, hence it is often resorted to.

Nitric acid is more especially useful where the ulceration is the result of mercurialization or syphilis. The saliva is acrid and offensive, excoriating the corners of the mouth; the teeth look yellow and are loose.

Aethusa has general aphthous conditions of the mouth and throat, with difficulty in swallowing, and the stomach is so involved in the process that milk is ejected in large curds. The vomiting is spurring in character, and attended by prostration.

Borax has long been used as a local application and is an excellent systemic remedy in the aphthae of children. General aphthous eruption characterizes the case; the mouth and inner surfaces of the cheeks are studded with minute aphthous points. The mouth is hot and dry, and is painful upon efforts to masticate or swallow.

Besides these remedies *Sulphuric acid*, *Iodine*, *Phytolacca*, *Kali sulphuricum*, *Rhus tox.* and others may be occasionally called for. Stomatitis mycose will usually indicate the remedies given in connection with the aphthous variety. In addition to these *Mercurius vivus* will be indicated when there is a great deal of fetor, with white lines about the gums, suppuration of the gums from the teeth, nightly aggravations of the sufferings, and bilious vomiting or diarrhea as an attendant. *Arsenicum* will probably be needed if pronounced debility characterizes the case. *Baptisia* and *Rhus tox.* are sometimes useful, stomatitis mycose occasionally developing with or being attendant upon states similar to those produced by these remedies. *Kali bichromicum* is especially applicable when the mucoid secretion of the mouth is stringy and tenacious. *Natrum sulphuricum* is homeopathic to any of the forms of stomatitis in which the tongue is heavily coated yellow at its base. Stomatitis characterized by the presence of intestinal diarrhea occurring in the morning will also be met by *Natrum sulphuricum*.

Coming to the ulcerative and gangrenous varieties the treatment will have to be vigorously local as well as constitutional. I cannot well picture the successful handling of a case of either of these forms without calling into requisition the permanganate of potash in solution of one or two grains to the ounce, carbolic acid one part to two hundred, or corrosive sublimate one part to three or four thousand. Calendula as a local remedy is very beneficial in the milder forms of the disease, but I have not found it so helpful in the more destructive processes; at least not unless improvement has commenced from the germicidal remedies just named. Absolute cleanliness must be secured, and this is difficult when pus and debris have burrowed down about the roots of the teeth, under

the alveola into the glandular tissues and generally infiltrated in the cellular tissues of the mouth and vicinity. Perfect cleanliness can rarely be secured by swabbing the mouth with pure water or the simpler medicaments. Chemicalization within safe limits seems to be required. Where pus has burrowed about the teeth and under the gums, and sublingual abscesses have formed, the peroxide of hydrogen, one-third strength, will assist in cleansing the mouth by decomposing the pus and fermenting it out of its pockets. Immediately that this has been applied the selected mouth-wash should be freely used, in every instance the mouth being subsequently thoroughly cleansed by the copious use of sterilized water, to which *Calendula* may be added.

Constitutionally, the conditions will require *Nitric acid*, *Mercurius*, *Phosphorus*, *Arsenicum*, *Carbo vegetabilis*, *Lachesis* and *Kali permanganum*.

Phosphorus is especially well suited to cases of ulcerative stomatitis characterized by continued bleeding from the gums; white or yellow lines about the gums; general emaciation of the patient; hectic and threatened or apparent development into activity of latent constitutional dyscrasia. It is also well adapted to those cases involving the bony tissues and periosteum.

Nitric acid is applicable in a large per cent of these cases because they are so often traceable to the abuse of mercury, whether in the infant or during its pre-natal life. The teeth are loosened and drop out; flakes of alveola are thrown off; the discharges are exceedingly acid and the fetor oris is intense; all the sufferings are aggravated at night.

Mercurius is a very useful remedy in ulcerative stomatitis where there is no previous history of mercurialization and the case is characterized by nightly aggravation, offensive breath, ulcerating gums and a high degree of salivation. The submaxillary and sublingual glands are enlarged and tender.

Arsenicum will be called for because of the severe degree of systemic invasion attendant upon gangrenous stomatitis, and because of the death of local tissues; gangrene of the gums; gangrene of the cheek, with pronounced hectic fever; black central spot in the ulcerative portion with infiltration of surrounding area; intense restlessness and prostration; pulse small and thready; extremities cold and edematous. Will not often be useful in the earlier stages of noma, but no remedy presents greater applicability to the gangrenous processes in stomatitis than does *Arsenicum*.

Lachesis, *Carbo vegetabilis*, *Secale*, *Naja* and *Kali permanganum* are also to be thought of in this connection. Escharotics, as Bromine, Chromic Acid and crude Nitric Acid are not often useful.

In diphtheritic stomatitis the treatment should be actively constitutional in order to guard against invasion and to check in-

vasion already commenced. Care should be exercised in the local treatment lest further abrasions of the tissues result and greater extension of the disease be produced. Local treatment by vaporization with weak solutions of carbolic acid, peroxide of hydrogen and permanganate of potash is practiced with reputed good results. By preference I should treat this class of cases altogether constitutionally, assisting nature as much as possible to set up her barrier against invasion. This accomplished, the membrane shrivels and falls off within a few days and the clean, healthy sore is left. When the membrane is prematurely separated it may then be well to stimulate local healing by the application of calendula, or of carbolic acid one part to two hundred; but even here *Arsenicum*, *China*, *Lachesis* and other indicated remedies will generally suffice.

Syphilitic stomatitis needs anti-syphilitic treatment. This will consist of the internal application of *Iodine*, *Nitric acid*, *Kali bichromicum*, *Mercurius solubilis*, *Phytolacca* or *Staphisagria*. It is not possible to select the proper remedy upon the mouth symptoms alone. The general condition of the patient must be taken into consideration, and the treatment, to be successful, will have to be directed toward the general systemic manifestations, the mouth symptoms perhaps being the key to the correct prescription.

CHAPTER XLVI.

ACUTE GASTRIC CATARRH.

General Considerations—Symptoms and Course—Simple Vomiting—Pathology—Diagnosis—General Treatment—Medication.

General Considerations.—Acute gastritis, or gastric fever, is an inflammation of the glandular tissue, involving generally the muscular and mucous coats of the stomach, attended by pain, loss of appetite, nausea, vomiting and fever, together with involvement of the muscularia, the mucous membrane of the mouth and pharynx, and sometimes, also, by disturbance of the intestinal canal. The term gastritis is now commonly applied to the more acute inflammations of the stomach, those that corrode and perforate it, caused by the ingestion of acids, various poisons and acute alcoholism; whereas stomach inflammation, as seen in infancy, is, properly speaking, a catarrhal inflammation of the mucous coat and its glands. Sometimes the disease extends to the muscularia, but as a rule is limited to the membrane. Ewald, in "Diseases of the Stomach," denominates it "glandular gastritis", which seems to be an appropriate name since it is the glandular

structure of the stomach that is especially concerned in the pathological process. This author contends that every case of gastritis is of toxic character, depending upon toxemia from local irritation and corroding substances, arising from the ingestion of food, either unwholesome in character or too great in quantity, its digestion not being perfectly performed and toxins resulting from incomplete or abnormal fermentation.

The disease is especially common during infancy. Not only does the stomach rapidly increase in size during the earlier months of infant life, from a very small pouch to a pouch of considerable dimensions, but it is physiologically necessary that it prepare itself for the digestive processes it will have to perform as the various foods of progressive development are made necessary by the advancing months and years of child-life. During the first half year the infant grows very rapidly. During the second half year its increase is not so great, but is yet considerable. The stomach is the boiler into which the food is put for fermentation, and with the increasing demands of the infant it has greater quantities to accommodate and increased labors to perform. Nature has so constructed this organ, anatomically and physiologically, that it can digest only food prepared to in every way meet her requirements; and when there is failure of the mother to supply the proper amount of nourishment, or when it becomes necessary from any cause to rear the child artificially the infant stomach is at once rendered liable to disturbances of its initial functions and hence this viscus is laid liable to gastritis.

Infants fed at the breast are not very subject to gastric catarrh, nor in fact to any disturbance of the stomach, unless, perchance, the mother is very careless and partakes of articles of diet that cause distress to herself and her infant; and even then the intestines are more likely to be disturbed than the stomach. Violent disturbances of the maternal nervous system, as anger, fright, long grief, may so affect the infant as to develop in it acute irritation, if not, in fact, acute inflammation of the stomach. The too early appearance of the menstruation during the nursing period sometimes acts deleteriously upon the milk, and occasionally during violent attacks of illness, especially puerperal fever or typhoid fever, where the baby has been held too long at the breast after fever has set in, it may be the sufferer because of the changes that occur in the maternal milk.

Artificial feeding is the special cause, however, of stomach disturbances in infancy. The administration of non-pasteurized milk introduces various bacteria into the system that set up trouble. Pure cow's milk, with its heavy casein coagulating in curds, is often the cause of stomach disturbances and inflammation. The pögeletary foods containing a large amount of starch and foods rich in lactose are prolific causes of acute gastritis. Overfeeding,

or too-oft-repeated feeding, allowing the stomach no rest, causes severe forms of infantile dyspepsia by the addition of fresh food while the stomach is filled with food that has already undergone partial digestion. This may be classed among the common causes of the disease in babies. In other children it is developed upon administration of too great variety of food and quick-knacks, especially sweets, pickles, canned fish, and pastries rich in sugar and butter. It is often caused in children old enough to attend school and engage in the vigorous plays of child-life who become so interested in their occupations that they hurry from a half masticated meal to the school room or play ground, imposing upon the stomach the duty of mastication, and that, too, without proper admixture of saliva with the food. As stated in connection with the consideration of rickets in many of the constitutional diseases the stomach partakes of the general debility of the muscular system, and the gastric juice is not as vigorous in its chemistry as in children suffering no manifestations of any of the constitutional diatheses. In these children the various stomach troubles are much more likely to develop. Tubercular children are frequent sufferers from dyspepsia, whether a few months or a few years old. In many of the fevers of childhood there is alteration in the character of the gastric secretions, and catarrhal irritation of the viscus is the result. It is also often resultant upon suppression of eruptions, whether acute or chronic; fatal disturbances of the gastro-intestinal system are much more frequently and directly caused by the repelling of the skin diseases than is commonly supposed.

Symptoms and Course.—The onset of gastric catarrh is usually very sudden, and manifested by presence of fever, pain, tenderness over the region of the stomach, restlessness, and efforts to relax the abdominal walls by drawing up the knees, lying on one side, and curling up as much as possible. The pain may be mistaken for colic, but examination over the abdomen will reveal the location of the tenderness in the epigastrium. The fever quickly rises to 102° , 103° , 104° and even higher, the pulse beats rapidly, respiration is increased, the tongue is more or less coated or furred, and shows red at the tip and edges. The baby's cure-all, its bottle or the breast, will be taken eagerly, but the introduction of food into the stomach increases the pain and soon excites vomiting, when it is ejected in curds accompanied by mucus, sometimes quite green and generally sour-smelling. As the disease progresses the pain increases, the fever grows higher, dryness of the mouth and tongue occur, the abdomen is distended, there is complete loss of appetite, and the child is restless, its features showing suffering and distress. The attack is not usually prolonged, unfavorable cases developing gastro-intestinal catarrh, the stomach being more or less relieved with the oncoming of diarrhea.

In some cases constipation is present and distressing flatulence increases the pain and restlessness of the infant. With the stomach trouble the mouth is generally more or less involved; heat and incessant thirst are present, the child crying for water continually.

Occasionally cases of gastritis are unattended by fever as the fever assumes a very mild character, and but for the presence of the loathing of food and some disturbance of the stomach the cases would go unrecognized. Such cases last but a few days, the anorexia which attends giving the stomach sufficient rest to enable it to recover without pronounced illness.

The severer form of gastritis which has been described may run a course of a few days or may last a week or two. It is much more apt to be severe if after forty-eight or seventy-two hours it is complicated by intestinal irritation and diarrhea. In older children the disease is not as likely to be attended by vomiting as in infant life, and when it occurs vomiting is much more likely to be bilious, with retching and straining and a watery mucous discharge from the stomach. Children of five or six or eight years of age will assume more or less of the typhoid state. They will suffer headache, languor, indisposition to play or attend school, pain in the stomach, and sometimes high fever. In confirmed cases the *linea oris et nasalis* is pronounced, almost as much so as in the initial stage of scarlet fever. The headache, which is usually frontal, is quite severe, and in some cases characterized by a good deal of fever; hydroa occur on the lips, sometimes confusing the ailment with malarial infection. In rare cases jaundice occurs as a symptom, probably from the extension of the inflammation from the stomach to the duodenum.

Danger from gastric catarrh in early infancy is not very great except as it may develop reflex convulsions, which, in turn, may result in cerebral hemorrhage. This complication is much more likely to follow where the stomach is overloaded with food and digestion is so interfered with as to be completely stopped, the food lying like an offending load in the gastric viscus. Should nothing of this kind develop and the case go on it is quite likely to be attended by diarrhea, which sets in in two or three days, sometimes earlier, after the subsiding of the initial symptoms, the case then assuming the form of gastro-intestinal catarrh. In children four or five years of age or older over-distention of the stomach in connection with inflammation of the organ may cause temporary reflex paralysis, which disappears promptly upon the emptying of the viscus, either by emesis or *via naturalis*.

Simple Vomiting.—This often occurs in infancy without developing into a case of glandular gastritis, the irritation in this case being reflex and the causes often remote. Vomiting is often directly traceable to the eruption of a tooth. In other instances

it may be due to the irritation belonging to the development of the teeth in the maxilla. It may accompany bronchitis and is doubtless often due to mild forms of indigestion not attended by any considerable systemic disturbance. Of course the simple regurgitation of milk partially fermented is not being considered. An epidemic of bronchitis was reported in Minnesota recently in which vomiting was present in a considerable number of cases. It may be due here to the mechanical irritation of the bronchial mucus in the throat, as in whooping-cough, or it may arise from reflex irritation to the gastric nerve-centres in this or other infantile diseases; but these cases do not, strictly speaking, belong to the classification of gastritis; they are simply reflexes or mechanical irritations. In cases of gastric catarrh characterized by unusual intensity and acuteness the symptoms are very like unto cholera infantum. It is not very often that diarrhœal discharges attend the early stage, but as the disease advances they become more frequent and in pronounced cases become involuntary. While not common, yet instances are met with in which vomiting is so violent and persistent that exhaustion sets in early, the child wasting rapidly and the condition known as hydrocephaloid coming on. Coma supervenes, the pupils widely dilate, the respirations become jerky, the Cheyne-Stokes breathing follows twitching of the face and limbs occur, and convulsions may come on during the first few days, frequently bringing about an early fatal termination.

The ordinary course of acute gastric catarrh covers about ten days. While many cases get well earlier the majority drag along into a sub-acute condition, weeks intervening before the stomach will have recovered its normal condition and be able to perform its functions properly. In other instances the intestines become so involved in the process that chronic intestinal catarrh is a sequence that may last several months and cause no end of anxiety if the hot season be on and the child be the subject of artificial feeding.

Pathology.—The name given this ailment, gastric catarrh or acute gastritis, is directly expressive of the pathological state. As Ewald has shown in his treatise on the stomach the structure chiefly affected is the tunica glandularis. The mucous membrane is not primarily affected, the cause of the disease being traceable to a disturbance in the chemistry of the gastric juice secreted by the glands of the mucous coat, and not until they have become inflamed and the natural secretion changed to an alkaline mucus does the mucous coat become involved. It is eventually swollen and reddened and small erosions appear over the surface in severe cases. The stomach tissues are infiltrated and edematous. As the case progresses the entire mucous tract becomes involved, as does the muscularia also.

Diagnosis.—This disease is not apt to be confounded with other cases of child-life. Its suddenness of onset with acuteness and fever may suggest scarlatina, but the absence of exposure to contagion, the fact that the infant is younger than most children attacked by scarlet fever, that it is usually an artificially fed baby, and that there is absence of the characteristic rapid pulse and the prompt appearance of an eruption on the upper part of the chest, render the differentiation easy after a few days. The erythema that presents in connection with stomach troubles is not likely to be mistaken for scarlatina except by the careless observer. The high temperature and the fact that the breathing is quickly affected might suggest the oncoming of bronchitis or pneumonia, but the absence of the cough and also the absence of the expression of pain on breathing that belong to pneumonia will serve to separate the two. Any confusion from typhoid suggestion may be lessened by remembering that typhoid fever comes on more slowly and is not likely to be attended by the same acuteness of vomiting, is usually seen in children somewhat older, and presents ilio-cæcal tenderness as against pain in the epigastrium. Brain vomiting is much more sudden and of a spurting character. Furthermore, it has either tuberculosis or dentition as its immediate cause. As a matter of summary, it is not necessary that this ailment be confounded with other diseases of child-life if even ordinary care be taken in making up the diagnosis.

General Treatment.—The stomach should have as nearly as possible absolute rest during the attack of acute inflammation of its mucous and glandular structures. The presence of the food not only irritates inflaming tissues, but the gastric secretion is so altered that food is not easily digested, and, furthermore, becomes a source of irritation, both mechanical and chemical. Children suffering gastric catarrh should be almost entirely suspended from food. It is sufficient to administer plenty of pure sterilized water in small quantity oft-repeated. The subjects are usually thirsty, and not infrequently their restlessness and distress can be overcome by the administration of a refreshing drink. Milk is not a good food at this time; if the child should be inordinately hungry it may be administered in small quantities diluted, after twelve or twenty-four hours of stomach rest. It will be better in case symptoms of exhaustion are manifested to support the patient a day or two by rectal alimentation rather than to introduce food into the stomach when it is already in a state of irritation. If the child be above a year old moderate quantities of weak mutton broth, absolutely free of fat, of thin barley gruel which has been strained, or rice water, may be gradually administered at occasional intervals—as often as once in four hours—where, from apparently good cause, absolute rest must be denied the stomach. There is very little danger in exhaustion, whereas fatality is often insured

by repeated efforts at feeding when the administration of food only increases the irritation and emesis. In some subjects moderate draughts of hot water will allay thirst and serve to quiet the stomach irritation. If vomiting is attended by severe straining, and only quantities of glairy mucus are thrown off with each effort it will be helpful to allow the child to take copious libation of either hot or moderately cool water, with the thought of thus securing complete emptying of the stomach either by successful emesis or by carrying the mucus already in the stomach on into the intestinal canal.

Not only should the stomach have rest, in freedom from food, but it is desirable that the infant be kept as quiet as possible. Just as nausea is intensified by movement in adults so it is with children. The constant changing of position, tossing, jolting and carrying of sick babies with an idea of allaying their distress, when the stomach or intestines are involved, is calculated to increase their suffering. If the infant can be kept quiet, lying upon its back or right side, the irritation and vomiting will usually be less.

In individual instances the application of cloths wrung out of cool water and laid across the epigastrium will be found comforting. If the fever is very high and the head very hot cool applications to the forehead and base of the brain are not only permissible but desirable, and in case of violent pyrexia the cool pack will often save the child much suffering and danger from convulsions, as well as exhaustion depending upon high combustion.

It ought to go without saying that the child should be placed in the very best possible sanitary surroundings. Foul odors, stuffy sleeping rooms, pollution of the air by noxious fumes, all have their influence upon the physiology of the infant and operate against its prompt recovery; especially when the stomach is affected do offensive odors increase the tendency to nausea, and, therefore, aggravate all the symptoms. If possible children living in tenement quarters, or in the best surroundings for that matter, should be removed to the country, or at least changed to some other locality than that in which their disease commenced, preferably to open surroundings with better sanitary conditions.

Medication.—Of the remedies to be used two classes present, those bearing affinity to the digestive organs and those affecting the cerebro-spinal system. Should the disease set in by fever, and inflammatory pyrexia characterize the first few hours or days of the case, *Aconitum*, *Gelsemium*, *Belladonna*, *Ferrum phosphoricum* and *Veratrum viride* will be found most useful. On the other hand, should the case be ushered in by a moderate fever, with a greater degree of distress at the stomach and more nausea and vomiting, *Arsenicum*, *Ipecac*, *Pulsatilla*, *Antimony*, *Bismuth* and *Nuxvomica* will be found to be the list from which the appropriate

remedies will be selected. If with the fever intense pain characterizes the onset *Magnesia phosphorica*, *Colocythis*, *Belladonna*, *Dionarea*, *Cuprum*, or *Veratrum album* may be selected.

Acetabulum will meet the symptoms calling for *Acetabulum* in any ailment. It is not necessary to more than refer to the characteristic heat, restlessness, thirst, anxiety and fretfulness.

Belladonna is more applicable when with the fever the face is flushed and the pupils are dilated, the brain sometimes early showing its reflex. The gastric pain occurs in paroxysms with suddenness and violence.

Ferrum phosphoricum has less acuteness at the onset than *Acetabulum*, but still the fever is pronounced, the pulse full and compressible, and pain and attending nausea moderate in severity.

Gelsemium is more like *Belladonna*, but the fever is higher and the skin is moist. The brain is affected, the pulse full bounding, yet not hard and wiry. Convulsions threaten. Child is very hot and its nerve tension is very great.

Antimonium crudum has heavily coated tongue, the coating being thick and pasty, either yellow or white. This is quite characteristic. *Antimonium* children who suffer from gastric disturbances are immoderate in their diet. It consists largely of sweets and pastries, the stomach being constantly disturbed. These cases are characterized by fever upon slight provocation, which is more promptly met by *Antimonium* than any remedy that I have used.

Pulsatilla is very like *Antimonium*. It has gastric catarrh from ice-cream, fruits and pastries; rising of sour water from the stomach and complete relaxation with every vomiting.

Nux. vomica is suited to cases attended by constipation. When the bowels are loose the stomach symptoms are better. Child is cross and irritable, evidently has headache. Suited to cases dosed by domestic remedies, or whose stomachs have been disturbed by improper diet.

Arsenicum has severe vomiting, extreme tenderness in the pit of the stomach, tongue coated very white, diarrhea of undigested, slimy stools. Child is very much collapsed. Face looks pinched and extremities are cold. General anæmic picture.

Bismuth.—Nausea with convulsions, gagging, vomiting of bile, burning in the pit of the stomach and gastric region; vomiting upon the slightest motion, convulsive belching of gas in the stomach, and cadaverous smelling stools.

Colocythis has sharp, acute, colicky pains in the intestines in connection with gastric catarrh. Child cries piteously and violently, stomach is distended; flatulence gives relief.

Veratrum album has continuous vomiting; hippocratic face and coldness and clamminess of the extremities. Vomiting is increased upon rising from lying positions, and with each vomiting spell the child collapses.

Hyæmia will occasionally be called for where the child is intensely thirsty, drinks large quantities of water greedily. Vomiting after each effort at motion.

Phosphorus is sometimes called for. Child vomits as soon as the water has reached the stomach; is relaxed; stomach and abdomen collapse, with coldness of the extremities and body.

Cocculus, *Nali bichromicum*, *Mercurius*, *Podophyllum*, *Iron* and other remedies may be useful in individual cases.

Tannicus will occasionally control excessive tendency to collapse, vomiting and nausea attendant upon this as upon other infantile diseases.

CHAPTER XLVII.

CHRONIC GASTRIC CATARRH.

General Considerations—Symptoms and Course—Diagnosis—Treatment—Diet—Nitrogenous Food—Stomach Lavage—Stomach Gavage—Remedies.

General Considerations.—Following upon acute gastric glandular inflammation of the stomach a sub-acute or chronic condition often ensues, dragging over a period of many months and sometimes lasting more or less through life. The effect of the acute disease has been to so interfere with the secretive function of the tunica glandulosa as to render its secretion more feeble in digestive power, and therefore, resultant in feebleness of the organ with more or less permanent impairment of its office. While chronic catarrh follows upon the acute manifestation of the disease, in many cases the condition is developed so gradually that it is not traceable to acute symptoms. The ingestion of large quantities of unwholesome food, or of food that is taken so greedily or hurriedly that it is not properly masticated and not insalivated is frequent cause of this chronic debility of the stomach. Improperly cooked food, the excessive use of sweet-meats, hot breads, and foods cooked with much grease, together with irregularity of eating, and the faulty habit in children of drinking copious draughts while eating, are all productive of chronic catarrh. It sometimes is seen to follow also upon other diseases, as typhoid fever, diphtheria, measles, etc., and is more frequent in children of debilitated constitutions. It has already been shown that in rachitic and tubercular subjects the gastric secretions are not possessed of full vitality, and, therefore, are not capable of performing their part of the digestive function with complete success, with the result that the stomach is distended and more dilated than it should be, and from these combined causes chronic catarrhal conditions are set up.

The pathological conditions which exist in this form of the disease are really but an extension of those belonging to the acute variety. The mucous membrane is in an unhealthy state. In places it is somewhat reddened and engorged, or is pale gray in color. Its epithelium is swollen, the mucous tissue generally being thickened. The change in structure is more noticeable near the pylorus where the parenchyma of the stomach is also involved. Microscopic examination will show changes in glands and their ducts, and even in the gland cells. Fatty degeneration of the latter occur, and complete atrophy of the mucous membrane follows. The glandular tract becomes so shriveled or hypertrophied and so interfered with in its functions that the stomach is never capable of performing its full duty.

Chronic diarrhea often attends upon tuberculous conditions, and, conversely, the development of tuberculosis in subjects so predisposed is often directly due to chronic dyspepsia depending upon confirmed catarrhal conditions of the stomach or glandular atrophy of that organ. It also belongs in children to kidney disease resultant upon scarlet fever or other ailment. While it is beyond question caused by the non-elimination from the system of toxic matters circulating in the blood that should be thrown off through the kidneys, disturbance of the portal circulation with pronounced icterus may result in gastric catarrh, and in malarial sections it may depend upon chronic intermittent fever, or bilious states, where by the reflux of bile the acidity of the gastric juice is neutralized, and thus the function of the stomach is so impaired that the disease under consideration is set up.

Symptoms and Course.—This form of stomach disease is not attended by manifestations of pain, nor by fever, nor by pronounced vomiting. The symptoms are more dyspeptic in character. There is sometimes impairment of the appetite amounting to distressing anorexia. The stomach is tender to pressure and a sensation of goneness prevails, or a sensation as of a load lying in the stomach is complained of. In some instances children will speak of the stomach's being hot, and in others the feeling is one of coldness. In still other cases there is a qualmishness, or "stomach vertigo," lasting a minute or two, during which time the child will be white about the mouth and will break out with cold sweat about the face, the presence of worms being suggested. Sometimes the stomach is enormously distended with gas, the organ being much larger than it should be, its muscular fibres having lost their contracting power to a certain extent. The nervous system shows more or less disturbance. The child is peevish, fretful, notional. It whines and cries easily, and is manifestly ill. Sleep is more or less disturbed and both stomach and intestinal digestion are so interfered with that colicky pains, intestinal flatulence, pronounced constipation, or perhaps diarrhea,

add to the distress. Unnatural cravings, and desire for knick-knacks and unwholesome foods characterize the case, the child refusing the ordinary food of the table, being so notioneate that it is impossible to please him. If the acute form of the trouble is gradually turned into the chronic variety in bottle-fed babies the question of nourishment becomes a serious one. In these subjects the breath is foul, the tongue coated, the child is restless and whiny, emaciation characterizes the case and general infantile marasmus follows, unless relief is soon obtained. Older children are not likely to suffer vomiting, but complain a great deal of being sick at the stomach, present pallor, dark circles under the eyes, some heat about the head, are restless at night, and peevish and irritable without apparent or adequate cause. Their distress becomes more pronounced when eating, and careful examination will enable the physician to outline the area of tenderness, it being limited to the stomach, and greatest near the pylorus. The tongue is large and flabby, furred at its base and the papillae at its edges are reddened and enlarged. Sometimes the tongue is mapped or patched in crescentic patches.

As may be understood, children suffering this form of stomach trouble are unwell generally. The muscular system is below par and they are not as vigorous and hearty as they should be. The nervous system suffers also. Irritability gets to be confirmed. Heat of the head is a more or less constant attendant. Disturbed sleep and unpleasant dreams, often to nightly terror, are annoying symptoms. Choreic twitchings and even chorea minor will often be traceable to the stomach, with its impaired digestion and symptom-begetting possibilities. In young girls approaching the age of puberty who are sufferers from chronic catarrh menstruation will be delayed or be excessive, from debility, and a chlorotic state will frequently result. Boys so affected are likely to suffer relaxation and reflex sexual symptoms. In younger children the alimentary tract shows such a degree of unwholesomeness that intestinal parasites find ready lodgment and develop, adding their complications to the case. Whether these be present or not reflex irritations, such as picking at the nose, the stomach cough, gulping, "stomach swallowing," scratching at the anus, etc., are often witnessed.

The course of chronic catarrh varies in children, depending upon their physical resistance, their constitutional dyscrasia, its severity, and the proper care on the part of parent or nurse in the preparation of the diet, and other stomach hygiene. If the acute inflammation has been severe and pathological changes are pronounced it may last throughout childhood and often permanently impair the function of the stomach. Continued distention to abnormal degree results in permanent dilatation of the viscus. In these cases the stomach is enlarged and flabby, the epigastrium

perhaps distended, the circulation interfered with, by virtue of the pressure of the dilated stomach upon the heart, and because of the debility of the digestive organs intestinal digestion is so interfered with that chronic conditions of the alimentary canal result upon stomach disorder.

Diagnosis.—This is not difficult, the history of the case being so clear as to make it apparently easy. The tenderness in the region of the stomach, the abnormality of the appetite, imperfect digestion, nervous perturbations, coating of the tongue, fetor of the breath, lack of proper physical endurance, all go to make the picture clear. If careful differential diagnosis is desirable it may be necessary to examine the contents of the stomach chemically and under the microscope. This can be done by securing portions ejected by vomiting or by washing the stomach by means of the stomach tube. The differentiation as laid down by Ewald, Whittaker and others is that in simple gastritis the quantity of hydrochloric acid is less than it should be, while lactic acid and butyric acid are present. The mucous form of the disease is characterized by the presence of mucus in excess, and in the parenchymatous form with glandular atrophy hydrochloric acid and pepsin are often found to be absent.

It may be necessary to differentiate this disease from the wormy condition of children. The symptoms are very much alike as they refer to the reflexes and except by examination of the contents of the stomach it is possible to differentiate them only by expulsion of the parasites under treatment.

Treatment.—There should not be very much trouble in bringing chronic gastric catarrh to a favorable termination if proper hygiene and diet together with constitutional homeopathic treatment be applied to each case. The chief danger lies in the general undermining of the health from lack of proper nourishment, and in cases resulting badly malnutrition is responsible. This ailment partakes of the nature of dyspepsia. The proper selection of food will alone secure recovery in many instances. In others constitutional treatment lasting over a long period of time, together with radical changes in diet and hygiene and climatic surroundings, will be necessary to a cure. It is a disease given to relapses, and if it primarily depends upon debility of the gastric ferments because of constitutional dyscrasia it will require the exercise of considerable patience and perseverance in order to insure recovery.

The physiological treatment of dyspepsia will prompt the use of agents which will in good measure compensate for the deficiencies in allaying the irritations from which the stomach suffers, and by arousing the dormant vital energies to so tone the organ that it will be capable of properly performing its functions. It is well understood that there is a deficiency in hydrochloric acid and pepsin. Physiological treatments have been directed toward the

administration of the acid in such form that it will supply the deficiency and check the fermentation that is going on. The action of this acid on the stomach juices is to prevent organic fermentation. Ewald contends that the supplanting of it by lactic acid is not proper, since it is the hydrochloric acid alone upon which devolves the prevention of organic fermentation. That author uses hydrochloric acid in watery solution as a sour drink after meals. He restricts the use of pepsin to cases characterized by advanced mucous catarrh and atrophy, giving it in considerable doses in acidulated water, preferably hydrochloric acid water. There can be no question but that the proper administration of the physiological elements of the gastric juice is beneficial. I have never used the acid treatment in infants. Nor has it been necessary in my experience. The proper constitutional treatment will restore, when resorted to early, the normal functions of the organ if attention be paid to diet, and the condition will so improve that hydrochloric acid will show to be present in sufficient quantity. But I have a good word to say for pepsin. For years I have used Boudault's golden powder with most excellent results. In fact, I consider it the best aid to well directed homeopathic treatment that we have in the dyspeptic and summer complaints of children. I have restored many cases that would have otherwise resulted fatally by the administration of this ferment in doses of from one-half to three grains, depending upon the age and condition of the infant, after each nursing or feeding.

Diet.—Diet is of the utmost importance, but it is difficult to prescribe anything like a set diet for dyspeptic children. In a general way it is enough to say that pastries, sweets of all kinds, including candies, and very much sugar in food must be tabooed. It is absolutely necessary to the successful treatment of chronic gastric catarrh that only wholesome, nutritious food be administered. Milk is not usually permissible because of the presence of bacteria, and because of its tendency to gather in coagulated lumps and thus serve as a mechanical irritation. If it is given it should be pasteurized, and in confirmed dyspeptic children it is better that it be also peptonized.

Nitrogenous food which may be allowed, and which comes under the general classification of carbo-hydrates, are the nitrogenous flours, vegetables, fruits and legumines. Their digestion is easy if the starch has been changed into dextrine, and if the bread preparations are thoroughly well cooked. Partially baked articles are wholly objectionable. Vegetables, as cabbage, peas, beans, etc., cooked as they usually are are objectionable, but may be given in any form of leguminous flours. Partially cooked meats are admissible, but cold meats, meats warmed over, as so often served for children coming home late from school, are highly objectionable. A varied diet is preferable, and if the patient can have for

saue the hunger arising from outdoor exercise and plenty of fresh air digestion will be stimulated and made much more easy for the child than if it be kept in-doors and petted and pampered as a sick infant.

Children who are old enough should be compelled to masticate their food, and that thoroughly. There is no more common cause of dyspepsia in early life, or among adults either, for that matter, than that of bolting or washing down food. In a recent paper before the Homoeopathic Medical Society of Chicago Prof. Hawkes gave this as one of the most common causes of dyspepsia in his experience. The free use of liquids during eating is highly objectionable, and no parent can perform a better service for her dyspeptic child than to insist upon thorough mastication. It not only insalivates the food but oxygen is admixed with it in the bubbles of saliva and thus its ingestion is better accomplished. Furthermore the presence of oxygen in the stomach goes far toward imparting vigor to the juices of that viscus.

Vigorous morning bathing and brisk spongings are tonic in their effect, and should be practiced with dyspeptic children. The addition of coarse salt to the bath, preferably sea salt, is highly and justly recommended. While living in the Southwest it was my custom to buy sea salt in quantities and dispense it to almost every patient suffering from summer complaint or stomach disorders, for bathing purposes, and I learned to account it one of the most useful adjuncts in practice.

STOMACH LAVAGE.—In children whose stomachs are weak, and where there is a plentiful secretion of mucus, especially if vomiting is an attendant upon the condition, stomach irrigation is exceedingly helpful. It is a very simple procedure and should form part of the treatment in every chronic dyspeptic patient, infant or adult. The ordinary glass funnel to which is attached about a yard of rubber is all the apparatus that is necessary. With children from a pint to a quart of warm water will be sufficient. This lavage is performed by syphonage, the tube being passed down below the epiglottis into the esophagus and on into the stomach. There may be a little gagging at first but this is not apt to be long continued; the child soon learns that it is useless to resist and experiences such relief that it readily submits to the process. The tube is readily swallowed, as it were, after the first struggling efforts, and once it is fairly within the stomach the funnel, which has already been filled with a requisite quantity of water, is sufficiently elevated so that its contents will pass into the stomach. By gradually withdrawing the tube various portions of the stomach may be successively irrigated. After the water has been emptied from the funnel it may be lowered and in this way the stomach contents be syphoned into it. This process, as suggested, is a simple one and is very effective in cleansing the stomach. If the

presence of the tube excites excessive vomiting or nausea, or violent resistance on the part of the young child, the exercise of intelligence will be necessary. Lavage should not be practiced when common sense dictates to the contrary. On the other hand it is so beneficial that small resistance should not be allowed to determine its abandonment. Children who object too strongly to its use may have their stomachs washed by compelling them to drink copiously of water. If taken in sufficient quantities the stomach will throw it off and the same result will be accomplished. Even when it is not ejected not infrequently the stomach secretions are passed downward into the intestines and an analogous effect secured.

When stomach washing is practiced in infancy no food should be given for at least two hours after the irritation, and then nothing but bland and easily digested nourishment. Malted milk will be found an excellent article of diet for the first day or two after the use of lavage, half an ounce being given at the first feeding; but if children are nursing at the breast and the milk is vomited it is better to rely upon malted milk for the first day or two, when the breast milk may be restored. The whites of two eggs may be beaten up in two pints of water and then filtered and given as the sole nourishment for the first twenty-four or thirty-six hours. In the New York Infant Asylum lavage is very extensively practiced, and it is claimed that results attending upon it are in every sense satisfactory. It is a method that can be abused or properly used. It is a simple procedure and in many cases of gastric catarrh will be found among the most helpful known.

GAVAGE.—In occasional instances it may become necessary to practice forced feeding instead of resorting to irrigation in the hope of so cleansing the stomach as to restore the appetite. Food may be given through a small glass funnel attached to an India rubber tube two and a half feet long. The child should be held in a half-reclining position, supported by the nurse's right arm. The tube should be introduced and the quantity to be given should be poured into the funnel, which is then raised to the full length of the tube; as soon as the funnel has been emptied the tube is compressed and immediately withdrawn in order to avoid syphonage, or the return of any portion of the food as far as the pharynx. It has been shown that a considerable reduction in the death rate in the children's hospitals of Paris has been secured by means of forced feeding, this improvement being due to the absence of irritation of the vagus by the acts of swallowing and nursing and to the absence of any residue in the mouth which in decomposing offends the



FIG. 49.

gustatory and olfactory nerves, as well as to the absence of frequently repeated irritation to the stomach through its reduction of small quantities of fluid at a time. If lavage is practiced repeatedly the physician will soon be able to administer an ounce or two of food within a few seconds, whereas debilitated infants will require as many minutes as seconds at each feeding, with the exhaustion of a good deal of vital energy, and, if the nervous system is already debilitated, at a good deal of nerve expense.

MEDICATION.—The remedies called for in chronic gastric catarrh are few in number. *Antimonium*, *Pulsatilla*, *Nuxvomica*, *Arsenicum*, *Ipecac*, *Sulphur* and a few others will complete the list. Almost any remedy in the materia medica may be needed to meet special symptoms, but those named will suffice in the ordinary treatment of this condition.

Antimonium crudum is one of the most successful remedies I have used in the treatment of both the acute and chronic stomach disorders of children, especially the latter. The child is emaciated, its stomach is distended, its bowels usually deranged, the diarrhea being pasty, sour and offensive, the odor from the stools giving evidence of the food's not having undergone proper digestion. The child vomits every time it feeds or nurses, and manifests nausea and qualmsiness continually. Its tongue is heavily coated white, its breath is offensive, it is feverish, and it begins eventually to look scrawny and emaciated.

Sulphur is often found to be an excellent remedy from the fact that it suits the general constitutional condition of the child. If the stomach has long been deranged the child will look old and withered. The stools are very penetrating in odor, the abdomen is enormously distended and the child unhealthy in color. The stools excoriate and the patient suffers with colic and nightly aggravation of its symptoms. It cries upon being bathed.

Iris versicolor has protracted nausea and vomiting of an extremely offensive sour fluid about an hour after meals, showing that the food has not been able to appropriate all the acid secreted by the stomach. There is belching of gas and extreme intestinal flatus; is especially indicated in gastric catarrh with diarrheal complications in the summer or autumn, the stools burning like fire and excoriating the anus.

Pulsatilla.—The child is feverish at night, is peevish and fretful. It vomits after partaking of food. *Pulsatilla* is especially suited to stomach disorders of children who have eaten of pastries and other rich food.

Nuxvomica meets cases arising from the abuse of the stomach by highly seasoned foods and various knick-knacks in children and young subjects, the bowels being constipated, and the disposition one of vehemence, fretfulness and hunger. The *Pol-*

sapida child whines and cries over his troubles while the *Nax* child manifests temper. *Sulphur* is also to be thought of when constipation is pronounced.

Ipecac will naturally be thought of if vomiting is a persistent symptom, each emesis being followed by prostration. The child turns deathly sick and vomits excessively. Diarrhea of fermented stools; contents of the stomach which are ejected are fermented. Stomach troubles which are aggravated by the recession of skin eruptions are best met by this medicine and *Sulphur*.

Arsenicum is called for when the attack is violent and the prostration is pronounced; both stomach and bowels are involved, as in arsenic poisoning. The child vomits excessively and passes undigested stools; is hot and restless, with cold hands and feet and pronounced debility after any sudden aggravation in the course of chronic gastric catarrh.

Lycopodium is very helpful if the stomach is enormously distended and there is much gaseous accumulation. Child is hungry, cries from hunger but is notional in his appetite and soon-satiated; is emaciated, with muscles flabby and shrunken, while its abdomen is distended as tight as a drum, or else is completely sunken and collapsed. Owing to the non-elimination of the waste produce of the system red sand is seen in the urine.

Argentum nitricum will be indicated when the conditions are brought on by use of too much sugar or candies. *Bismuth* is an excellent remedy in the vomiting of young infants, where there is a good deal of nervous perturbation, as fright and dread of being left alone in crib or bed. Fluids are vomited as soon as taken. The *Phosphorus* child has vomiting as soon as the food or liquid gets warm in the stomach; is completely relaxed from the vomiting spells. *Aethusa* has sudden and forcible vomiting, the milk being ejected in great curds, the child being prostrated by the effort. Other remedies that will be called for are *Bryonia*, *Calcarea carbonica*, *Kreosotum*, *Psoraleum*, *Silicia* and *Carbo vegetabilis*.

In the main, however, it must be borne in mind that the secret of treatment of chronic gastric catarrh lies in correct feeding and proper hygiene. All the remedies in the materia medica will fail if wrong food be given, or if children who are subject to this ailment be allowed to gratify their individual whims and desires. Regular feeding of proper quantity of proper food, and exercise in the open air, with care in bathing and in the sanitation of the child's sleeping apartment will go far toward insuring recovery. When all of these conditions are favorable the selected remedies will assist greatly and even materially change the course of the disease; while without them the best selected remedies will as certainly fail.

INTESTINAL DISEASES.

CHAPTER XLVIII.

INFANTILE DIARRHEA.

General Considerations—Etiology—Symptoms and Course—Treatment.

General Considerations.—Infants and young subjects are very prone to looseness of the bowels. In many cases it occurs purely as a symptom of some constitutional disease or condition, but generally is indicative of disturbance of the gastro-intestinal canal, especially of the small intestines. The diarrhea of typhoid fever or peritonitis, of septicæmia, the diarrhea that occurs in connection with the ushering in of some cases of scarlet fever, the diarrhea attendant upon expression of measles, and the diarrhea of mental disturbances are hardly deserving of treatment as separate diarrheal diseases. They are symptomatic and, naturally, are treated in connection with their clinical relation to disturbances of the vital organism. On the other hand diarrhea occurs in infant life and in young children very frequently from idiopathic irritation of the intestinal canal, and is the chief or only manifestation of ill health; hence it is necessary in treating it to carefully differentiate its origin, to bear in mind the necessity of looking to its primal causes and to direct medication and general treatment accordingly.

Looseness of the bowels which occurs from the first digestion of the mother's milk, this frequently acting as a laxative, does not of itself need attention. The relaxation that occurs from mental emotions or from fright in older children is not a diseased condition needing medication; but continued relaxation in artificially fed children, or occurring during the teething period, especially in hot weather, or following upon improper feeding in children a few years old, or resulting as an acute disorder from prolonged thermal elevation and attended by acute systemic disorders, partakes of the character of illness that needs attention. The infant stool should be a bright-yellow homogeneous mass, without distribution of flakes of curd or shreds of mucus or particles of undigested food. Its color should be bright yellow, and not greenish-yellow nor dark green; nor should it be made up of small semi-liquid mucoid masses. It is of pasty consistence, dissolves readily in water, is not possessed of especially offensive odor, nor should its evacuation be attended by pain or distress. Departure from the normal in color, consistence, odor and frequency of evacuation and

from normal facial expression, which is that of comfort rather than that of pain, indicate disturbance of the alimentary tract from excessive or improper food or both.

Among the first manifestations of departure from the normal in infant life is the emission of offensive flatus. It is the earliest symptom of intestinal ferment, unless it be confined, when the pain will be the first expression of discomfort. If bacteria are admitted with food, or if bacterial fermentation from any cause be present in excess, gases will be evolved. Through incarceration, colic, enteralgic nerve shock, and even severe irritating processes are set up which result in disease of the intestinal membrane. Urtic acidity of stomach digestion early manifests itself by change of color of the stools, and also in the odor. They are green or greenish-yellow with much fermentation, contain particles of undigested food, and are generally sour. The longer they remain in the diaper the greener they become. Wateriness of stool implies outpouring of intestinal serum and is mechanically due to efforts on the part of the system to throw off and get rid of irritating and foreign substances, or more commonly a paresis due to central disturbances not yet made fully manifest. Diarrhea often occurs from simple indigestion and is soon over with. Improper food has been given, or too much may have been administered, and the forces of nature at once set to work to get rid of it, with the result that a few mushy and gushing stools, more or less painful, and more or less offensive, occur, and nature's equilibrium is promptly restored.

It is only when diarrhea is persistent, and when from it or with it general systemic disturbances set up that it becomes especially significant. The summer diarrheal diseases of infancy occurring during the teething process are among the severest and most fatal disorders we are called upon to treat, ranking next in fatality, taking the year through, to diphtheria, and if taken by the hot months, during which they are apt to be prevalent, they lead in numbers of death.

Etiology.—The acute form of enteritis is so commonly associated with the teething process of infancy as to have been considered a part of that process, almost a necessary part, in fact. An examination of the records of health offices will show a very large number of mortuary reports attributed to the indefinite term of teething. Acute intestinal catarrh is very often set up through nervous irritation belonging to dentition. Of this there can be no doubt. It is a clinical fact that neutralizes all theories to the contrary. Vaughn and other recent authors are so thoroughly imbued with the bacteriological idea of disease causation that they seem to fail to recognize the existence of any other cause. In children, as in adult life, diarrhea may be the result of emotion; it may be caused

by mental distress, fear, fright, anger, especially the exhaustion that follows colic, and there is no reason why the pain and irritation which attend upon abnormal or difficult teething should not result in disturbance of the digestive secretions the same as in other directions. The equilibrium of the digestive fluid is disturbed in difficult dentition; the hypersecretion of mucus in the mouth and throat so often accompanying this process result in alteration of the gastric secretion, and the fluids of the mouth and stomach pass on into the intestinal canal either too alkaline or acid to set up irritation of the mucous membrane of that canal. But the irritation of teething is more direct than this. It is a sympathetic or reflex nervous irritation. Vomiting and diarrhea are so often associated with dentition, apparently directly due to the cutting of teeth or to their eruption through the maxilla that this process is correctly recognized as a factor in very many cases.

Infantile indigestion through over-feeding is also a frequent cause of diarrhea. Children are as likely to suffer from gastro-intestinal disturbance through eating too much and too greedily as from any other single cause. Here the irritation is mechanical and physiological; for not only is the stomach rendered fatigued and over-distended by the admission of too much food at a feeding, but in its efforts to digest a too great quantity it is depleted of its fluids, and physiological excess or deficiency, or at least unevenness of secretion, of the gastric ferment is the result. In children artificially fed not only is the quantity given altogether too great as a rule in the earlier months of life but improper food is so often administered that it is a wonder the death rate from the summer diarrheal disease is not greater than it is; and so little attention is paid to the chemistry of food that parents and physicians are very often responsible for the sufferings of infants intrusted to them. The milk of a healthy mother contains all the nourishment ordinarily needed by the child, and children who are relying upon a maternal supply are far less likely to suffer from acute enteritis than those who are brought up artificially. Should the mother be a victim of tuberculosis, or should menstruation come on too early or be excessive, or should she be the subject of drink or other faulty habit, or should her own nourishment be chemically unsuited to its needs her infant may suffer and it may become necessary to resort to artificial feeding, even when the mammary supply is ample. After weaning children are subjected to too great variety of foods. It is not wise to take an infant from a single article of diet, as the mother's milk, and put it upon a generally mixed diet. It should be brought to a variable diet gradually. Commencing with the simple articles of the table, it may within a few months after being weaned be treated to quite a liberal allowance. Potatoes are the cause of much gastric disturbance. Foods containing too much grease, and sweets espe-

cially, are often the cause of gastro-enteric disturbance; the feeding of fat meats, especially pork, which should always be tabooed in child-life, is responsible for much of the bowel disturbance of children.

Climatic influence has very much to do with this disease, by far the greater proportion of them coming during the hot months of the summer. In the South the greatest mortality occurs in the early summer months, but in the Northern states the maximum will be reached late in July, in August, or the early part of September. Besides the factors mentioned, there can be no question but that certain bacteria and micrococci have causative relation to simple enteritis in child life. As has been shown in connection with infant feeding milk, both cow's milk and mother's milk, especially the former, contain various bacteria. This is not always the cause of enteric disturbance, else children would never get beyond the age of infancy, and the world would soon be depopulated; but the development of putrefactive changes in milk prior to its being taken into the system are among the most common causes of the active development of unnatural bacterial fermentation and consequent intestinal disturbance. It is the sugar of the milk that favors the development of bacteria. Booker and Eschrich have shown stools of diarrhetic infants to contain large numbers of bacteria, as many as forty different varieties, all of which produce important changes in the milk; and in the absence of all other certain causes it is quite reasonable to presume that in many cases bacteria are the cause of abnormal fermentations that result in putrefactive varieties of gastro-intestinal disease.

Symptoms and Course.—The first symptom to call the attention of the parent and physician to disturbance of the intestinal tract is quite likely to be an unnatural evacuation from the bowels. This does not occur, however, without premonitory restlessness, pain, flatulence, indifference of appetite, and perhaps vomiting. The pain may commence in the stomach, which is distended and tympanitic, or it may be in the intestinal tract after the fashion of colic. Borborygmi are to be heard and the intestines are sometimes so distended that their coils are to be plainly felt through the abdominal walls. After a season of fretfulness, restlessness and apparent physical distress a loose action occurs which usually gives relief for the time. Fever sometimes ushers in an attack of this character, but as a rule is not present. At first the discharges are quite normal in appearance but more frequent than they should be. They soon change in character, become more watery and serous and early show particles of undigested food and flakes of mucus. If acid, as is usually the rule, they become greenish and slimy, and instead of the bright golden color that belongs to the infant stool they may look like chopped spinach or frog scum. If yellow and watery there are apt

to be undigested particles of milk in the stools, giving to them somewhat of a lumpy character. They are often offensive even to the odor of putrefaction. With each evacuation the child is apt to obtain rest until the next accumulation has occurred, when it may again have pain, distension, flatulence and restlessness, to be relieved for the time, these symptoms being followed by another overflow of unnatural liquified stool. Sometimes both anus and naphæ are chafed from the acidity of stool, this in itself giving a great deal of distress. The diarrhetic child usually shows debility, especially after repeated watery stools; the features look more or less pinched, the pulse is more rapid and feeble, and the muscular system relaxed. During the paroxysms of pain there will be acceleration of pulse and increase of surface heat; the child cries piteously, and if the diarrhea be profuse its little features are drawn and sunken. When the small intestines alone are involved the diarrhea is more of the *lienteric* character; when the colon is inflamed the stools are likely to be thinner, more watery and mixed with mucus. The pains of diarrhea from the small intestine are of the *colicky* character, the feces usually contain portions of food, are more yellow in color and flocculent. If the colon be affected, especially the lower portion of its tract, there is more likely to be straining; the stools will contain mucus as stated, and be grayish and granular. It is not possible to differentiate as to what portion of the small intestine is involved, the duodenum, jejunum or the ileum, and for clinical purposes it is sufficient to ascertain whether the discharge indicates inflammation of the small intestine or the colon and rectum. The simple diarrhea of infants depending upon intestinal catarrh will not last under proper treatment more than a few days. Unfortunately, however, it arises in so many instances from improper feeding and from faulty food, and parents or nurses are so prone to continue a child upon the nourishment which has caused its ailment, that these cases often develop into chronic conditions that are difficult of successful treatment. Again, if the hot summer months be on and the child is dependent upon artificial foods, and be right in the midst of the teething process, the irritation of heat and pain and the drain upon its vitality incident to teething are factors that are difficult to contend against, and often render treatment altogether a failure. If of bacterial origin and the infection has been severe the danger is increased. Likewise, if caused by food from an unhealthy cow or by unwholesome maternal milk, so that the case is resolved into one depending even in part upon specific milk infection, greater trouble will be met in successfully combating the condition.

Treatment.—The common sense treatment of infantile diarrhea will begin with inquiry as to its cause. If it in any wise depends upon faulty food or improper administration of food

those evils must be corrected. This done spontaneous recovery takes place in most cases, and medication will not have to be resorted to long; whereas, if due to wrong food or to over-feeding and the evil be kept up the case will go on in spite of the best medication that can be administered. If due to seasonal influences extra care will have to be exercised against the chilling of the bowels and abdomen. A flannel band over the abdomen, or the addition of a light flannel undervest, so as to cover the stomach and abdomen, especially the lower part, will often modify the influences of unseasonable weather. If due to errors of diet on the part of the mother, as is very often the case should the infant still be at the breast, it is necessary that the maternal diet be corrected and that the mother restrict herself to wholesome, nutritious articles of food that are unirritating, since they may affect the milk. Diarrhea in infancy is often caused by improper feeding upon the part of the cow from which the milk supply is obtained. In droughty seasons cattle running at large on the prairies or in pastures will eat of weeds that contaminate the milk, rendering it wholly unfit for use and sometimes very acid and bitter. It will be better to take children off milk diet altogether and put them on diet from the table, or on prepared foods, rather than to allow them to continue the use of milk from cattle whose food is not of good quality and who drink from stagnant pools, low streams or of water from other unwholesome sources. As already stated, attention to these dietetic and hygienic conditions will frequently result in spontaneous recovery from infantile diarrhea.

Remedies that are found especially beneficial are *Antimonium*, *Peperilla*, *Ipecac*, *Nux vomica*, *Podophyllum*, *Gamboge*, *Gutti*, *Aethusa* and *Chamomilla*. Almost every medicine in the materia medica, especially those that have affinity for the gastro-intestinal canal, may be needed in special cases, but in the simple diarrhea of infancy I have not found it very often necessary to go outside of this list.

Chamomilla meets the mucous diarrhea of summer that is attended by colicky pains occurring toward evening, and of frequent light-greenish stools; the more the colic and the greener the stool the more the *Chamomilla*. The child is fretful, peevish, wants to be carried and likes to lie across the arm or shoulder, abdomen downward, because of the relief it obtains from pressure.

Aethusa has green, thin, bilious discharges; the stools are partly digested, and with the stool there occurs vomiting of curdled milk or greenish mucus; its aggravation is in the morning, belongs to the summer and during dentition.

Antimonium crudum is often found an excellent remedy for over-feeding or faulty feeding; milk too rich for the child's stomach; nausea, vomiting of slightly-changed food; the diarrhea

is profuse, watery and contains undigested food; the odor is strongly fecal. Where the gastric symptoms predominate the child's tongue is coated.

Hydrophylus.—Painless stool occurring early in the morning; waxy stool with meal-like sediment; involuntary stool while bathing or during sleep; painless stools or no pain before the stool, with straining and prolapse of anus following; stool very offensive, like carbon.

Pulsatilla.—Changeableness of stool; sometimes green, sometimes yellowish, sometimes offensive, at other times odorless; no two stools alike; stomach involved; nausea and vomiting followed by stool; child's pains relieved by the application of warmth over the stomach.

Gambel's gatti.—Cutting pains about the navel; child crying and fretting and manifesting pain, followed by expulsion of stool all at one time, giving immediate relief, relief lasting some time but pain setting up again as accumulation occurs in the intestinal tract; alternation of pain and relief, the latter following always upon copious discharge of the stool.

Ipecac, *Chamomilla*, and *Magnesia carbonica* have the characteristics of green stool; stool is green as grass. The *Ipecac* stool is fermented and putrid, very green and excoriating, attended by continuous nausea with coldness, relaxation and lassitude after stool; especially useful in the autumnal diarrhea.

Bryonia is indicated in diarrhea coming on during cool nights of early autumn; days hot and nights cold; sudden checking of perspiration in warm weather; sudden change of the temperature in the middle of the day from hot to cool by a thunder shower; diarrhea preceded by colic; stools light, painless, brown, undigested; very offensive; copious, pasty, offensive evacuations occurring from changes of weather.

Phosphoric acid is suited to diarrhea that lasts over a considerable period of time in spite of efforts to check it, with but little if any prostration; stools are white, copious and painless.

Iris versicolor has diarrhea with burning in the rectum and anus after stool; nausea with burning in the mouth, fauces and esophagus; greasy taste in the mouth; excessively offensive flatus attending passage of excoriating, mushy stool.

Calcareo carbonica will often be called for in the diarrhea of teething children which continues until it becomes chronic, without materially weakening the patient; stools are clay-like, undigested, offensive, odor of sulphuretted hydrogen.

Cheus is applicable to painless stool immediately after eating or nursing; diarrhea in hot weather occurring early in the morning; diarrhea in children from unripe fruit or diarrhea occurring after meals or other acute diseases; diarrhea of children in malarious districts occurring on alternate days, stool black, offen-

sive, undigested; cadaverous smelling brown stool, worse at night from error of diet.

Croton tiglium.—Very copious, yellow, dirty-green or brownish, watery stools, pouring forth suddenly, fairly shooting from the bowel.

Magnesia carbonata.—Stool green and frothy like the scum of a frog pond; white masses of stool like lumps of tallow floating on the green, watery stool; worse with hot weather and during dentition.

The following special indications in diarrhea are given by Lalienhal in heavy black type as being of special value in the treatment of diarrhea:

Acetic acid.—Diarrhea in phthisis.

Aloe.—Want of confidence in sphincter ani; diarrhea driving patient out of bed very early in the morning; worse in hot and damp weather.

Alumina.—Diarrhea on alternate days.

Arsenic.—Involuntary stools during sleep.

Arsenicum.—Diarrhea of malarial origin, or after chilling the stomach with cold substances; wants to lie with the head low.

Argentum nitricum.—Nervous diarrhea from emotions.

Boric acid.—Excessively offensive, scenting the whole house.

Borax.—Diarrhea just after breakfast.

Bromium.—Desire for acids which aggravate and cause diarrhea.

Bryonia.—Diarrhea from suddenly checked perspiration in hot weather.

Calcaria acetica and carbonata.—Chronic diarrhea which does not weaken the patient.

Camphora.—Collapse at the very commencement of the disease.

China.—Diarrhea particularly after meals and at night; painless, early in the morning.

Colchicum.—Diarrhea in hot, damp weather in the fall.

Croton tiglium.—Every movement of the body causes discharge.

Elaterium.—Profuse watery diarrhea without vomiting.

Ferrum.—Undigested stools at night or when eating or drinking; chronic, watery, painless diarrhea coming on every afternoon.

Fluoric acid.—On alternate days at a later hour each time.

Gamboge.—Stool expelled at once after considerable urging, followed by a feeling of great relief.

Graphites.—Stool mixed with undigested food and of intolerable fetor.

Gratiola.—Watery, green and frothy evacuations, gushing out with force; cold feeling in the abdomen.

Hepar sulphur.—Chronic diarrhea after abuse of mercury or quinine.

Lytaea.—Chronic diarrhea of an exhaustive character, whey-like; diarrhea from pancreatic affections.

Ipecac.—Continuous nausea, autumnal diarrhea; chronic diarrhea of miasmatic origin in combination with milk diet.

Iris versicolor.—Diarrhea with burning in the rectum and anus after stool; nausea with burning in the mouth, fauces and esophagus.

Kali nitricum.—Diarrhea from eating veal.

Lachert.—Diarrhea in spring when warm weather sets in; decomposed stool, looking like charred straw.

Magnesia carbonica.—Stools like scum of frog pond, green and frothy.

Natrium carbonicum.—Diarrhea during hot summer and after milk.

Natrium phosphoricum.—Diarrhea depending upon excessive acidity.

Natrium sulphuricum.—Diarrhea very sudden after rising and leaving bed in the morning.

Oleander.—Lienteria. Emission of fetid flatus like rotten eggs.

Petroleum.—Diarrhea always at the same time, better at night.

Phosphorus.—The anus remaining constantly open; chronic diarrhea with gradual loss of strength.

Phosphoric acid.—Diarrhea lasting a long time, apparently without any weakening effect.

Podophyllum.—Diarrhea especially during the early hours of morning; great weakness in the abdomen and especially in the rectum.

Prunum.—Horribly offensive diarrhea.

Psyllilla.—No two stools alike.

Rhus.—Sour, liquid, slimy, fecal stool mixed with green slime; worse when uncovering if even of only an arm or leg.

Secale cornutum.—Interminable diarrhea in summer, especially in scrofulous children; general weakness, aversion to being covered or to heat.

Strontia.—Diarrhea at night with great urgency; patient is scarcely off the vessel before he has to go again.

Sulphur.—The smell of the stool follows the patient all round.

Sulphuric acid.—Child smells sour after the most careful washing.

Tenacula.—Diarrhea follows immediately upon having been washed.

The list of special indications in infantile diarrhea and times of aggravation and amelioration, color of stool, concomitants, odor, symptoms before, during and after stool, and special symp-

toms for almost every condition of the system might be continued indefinitely, covering a large amount of space. For this the student had best refer to special monographs, particularly Bell and Laird on Diarrhea and Majumdar on Cholera.

CHAPTER XLIX.

CONSTIPATION.

General Considerations—Treatment.

General Considerations.—Constipation is an annoying condition arising from the torpor of the liver or intestinal glands, and is most commonly seen with children fed upon starchy foods and whose systems are weak, the muscular debility extending to the rectum and abdominal muscles as well as to the pedatory system. Children are frequently seen whose bowels do not move without assistance, sometimes going a week or ten days without an action, the stools being hard and clay-like and voided with considerable pain, even to the fissuring of the anus. Inveterate constipation is sometimes seen in children who are perfectly well otherwise, the habit being pre-natal, or due to a lack of muscular tone of the bowels. It is often directly traceable to the early administration of laxatives or enemas, nature quickly learning to rely upon assistance. Constipation in some children is due to the poor quality of the milk, nearly all of which is absorbed, there being little residue to be thrown off by the bowels; the rectum, not having its ordinary function to perform takes on inertia and constipation follows. In other instances there is too much curd in the milk and it packs in cheesy masses in the colon and rectum and is voided with great difficulty.

Artificial foods that are plentifully supplied with starch and contain a very large quantity of waste material serve to distend the bowels, paresis of their muscular forces following, with constipation as a natural finale. It should be remembered in considering this condition that, as with adults, children differ. Inactivity does not always mean constipation. If the digestion of food has been so perfect that there is no residue, or but little, there will be a correspondingly less amount of fecal matter. On the other hand, if the liver is active and the intestinal glands are active and there be a considerable amount of waste material in the food the stools will be correspondingly copious in quantity. The normal condition in infancy is two or three or half a dozen stools daily of the thick pasty, golden-yellow character described, voided without pain, not especially offensive, not moulded, nor accompanied by

an unusual quantity of gas. Large, hard stools, giving pain in pressing and being voided with difficulty, are not indicative of a normal state of the digestive process, as of the food administered. The condition is productive of harm in the fact that injuries to the rectum and anus, and not infrequently hernia, are the result of severe straining and efforts at stools. One of the most common causes of constipation in infant life is the resort to enemata, suppositories and oils. In her economy nature is supposed to have known how to make a perfect alimentary canal and how to perform the natural digestive process. It is not essential that the baby's bowels should move unless it suffers inconvenience, and many an officious nurse or over-anxious mother has started an infant on the way to inveterate constipation by trying to improve on nature's methods and physicking the baby while it is so helpless that it is wholly at her mercy. In early infancy is the better time to correct the habit of bowel torpor by proper medication. Even what appears to be an hereditary tendency in this respect can often be overcome by a few doses of the proper constitutional remedy, whereas laxatives, purgatives, suppositories and enemata are almost certain to increase the trouble. While perhaps occasionally permissible their routine practice is to be condemned. Often the food will be found at fault and a simple change on the part of the mother to more relaxing diet will act promptly with the infant. If, in spite of proper maternal diet, the milk is contributing to the child one or two feedings a day of Mellin's food will probably overcome the difficulty. If cow's milk is being used it should be pasteurized, and Mellin's or other selected prepared food be given with it.

Treatment.—Remedies which will be especially helpful in the torpor of infancy are *Aluminum*, *Plumbum*, *Graphites*, *Sulphur*, *Lycopodium*, and *Bryonia*.

Aluminum.—The *Aluminum* child has no desire to stool nor disposition to pass it, even though considerable be accumulated. The rectum seems inactive and even soft stool is passed with difficulty. The muscles and fibres of the rectum are torpid, evidently, and the pouch lacks tone and vigor.

Plumbum.—This remedy is suited to infantile constipation where the moisture of the stool has been absorbed and it is hard and lumpy, causing fissures, and is voided with difficulty, requiring severe straining; stool is hard and crumbly; the child suffers from colicky pains and its abdomen is collapsed.

Nix coccinea.—Stools are large, and the constipation alternates with diarrhea. The child strains unusually severely to pass large hard accumulations. It cries hard and is irritable and fretful. The stools are hard and large; child suffers from hemorrhoids. The mother is a coffee drinker and uses highly seasoned foods freely.

Graphites.—Hard, knotty stools covered with mucus, atonic constipation; no desire to stool. Stools are large in size, cracking and fissuring the anus and rectum.

Bryonia.—The alimentary tract is so dry that the stools are as dark and hard as though burned. Torpor of the liver, inertia of the rectum. Stools are so hard and dry that they are passed with great difficulty.

Sulphur.—Habitual constipation; no movement without help; difficult stools, breaking away in little chunks; efforts are so painful that they are discontinued; torpor of the infantile bowel without the least manifestation of disposition to stool.

Lycopodium.—This remedy is well suited to the constipation of infants that is attended by colic, with or without flatulence; abdomen distended, muscles relaxed, feces hard and scanty, passing with difficulty; rolling and rumbling of gases in the bowel, with pronounced constipation.

Opium, *Phosphorus*, *Silicia*, *Hydrastis*, *Colinsonia* and *Calcarea carbonica*, are remedies that have served me well in the constipation of infants, but I have found *Graphites*, *Plumbum* and *Nux vomica* to meet the majority of cases. No medication will be found of material benefit if the diet be at fault and if the constant practice of dragging and rectal flushing be persisted in.

CHAPTER I.

DYSENTERIC DIARRHEA.

General Considerations—Symptoms and Course—Diagnosis—Treatment—Diet—Medication.

General Considerations.—Young children are more often the subjects of dysenteric diarrhea following upon acute attacks of simple diarrhea, or enteritis, than from dysentery occurring as a disease *per se*. The latter is an inflammation of the mucous membrane of the colon and rectum, and may present as an acute disease coming on suddenly and without previous illness, or it may result from long continued catarrhal enteritis, the dysentery setting up as a secondary process. It occurs sporadically, is sometimes seen endemically, and is occasionally met with in positive epidemics. In malarial districts either spring or fall dysentery presents as a prevailing disease, and in some sections is among the more fatal maladies. During a residence of some years in an unusually malarious portion of North-central Texas the author met with repeated epidemics of unusual severity, the dis-

case not being confined, however, to children, although much more frequent among young children than adults.

Dysenteric diarrhea is the result of an extension of the inflammatory process from the small to the large intestine. It is not infrequently seen to follow acute infectious diseases, especially measles, and occasionally whooping-cough. I have witnessed two epidemics of dysenteric diarrhea following measles, occurring in unfavorable seasons, that is, in raw, damp weather, in which the fatality was considerable, in old school practice absolutely frightful.

Symptoms and Course.—Occurring first as a simple diarrhea the abdomen becomes more distended and tenderness upon pressure in the left iliac region is early experienced, showing that the inflammatory process has reached the sigmoid flexure. The stools, which have heretofore been diarrheal in character begin to show traces of mucus and blood and soon largely consist of these. Evacuations are preceded by straining and tenesmus, and in young subjects who are unable to resist prolapse of the rectum occurs. If the intestinal irritation be considerable the inclination to stool becomes almost constant. The child desires to remain on the vessel continually. In older children the stools are lumpy and mucoid, or consist of clear mucus streaked with blood. The more of the dysenteric feature the case possesses, the more certainly will the evacuations be composed of nothing but blood and mucus, and presenting as dysenteric diarrhea, or *lienteric dysentery*, the stools are usually composed of a mass of partially or completely digested food, bloody mucus, biliary matter and intestinal debris. The stools are larger than in dysentery proper, and smaller than in diarrhea. They are liquid, sometimes scalding, and there is more tenesmus than with diarrhea, but usually much less than with dysentery. The term *dysenteric-diarrhea* is a convenient one to describe *enterocolitis* plus inflammation of the sigmoid flexure and rectum, as distinguished from the *enterocolitis* of nursing children, or ordinary summer complaint of teething infants. This form of bowel trouble tends to become chronic, and while not dangerous to life in its acute manifestation is apt to present frequent relapses, until eventually the system becomes exhausted. The mucus which passes with the stool denotes a catarrhal condition of the larger bowel, especially the transverse colon, and examination in these cases will reveal a good deal of tenderness and soreness about that portion of the canal. The stools are usually persistent and attended by pain. There is considerable gaseous distension, and cases manifesting acute symptoms of dysenteric inflammation following closely upon intestinal catarrh are apt to present fever, chills, thirst and other systemic disturbances. This form of bowel trouble is seen in all seasons and in all subjects. It is more likely to show in the fall when the days are warm and the nights cool.

and in phthisical and rachitic children it sometimes occurs as "winter dysentery."

Diagnosis.—Dysenteric complications of infantile diarrhea depend upon bacteria in most cases, introduced either with the food or drink. It may result from intestinal toxination from imperfect digestion. The transmission of partly digested food may so injure the intestinal tissues as to operate as an exciting cause. In other instances the irritation of the mucous membrane occurs from the acrid secretions from the small intestines and they are responsible for the colon inflammation. When from micro-organism cause it depends upon the *ameba coli* of Loesch, a plasmodic, motile organism found plentifully in dysentery and in the mucous portions of the stool of diarrhetic dysentery. It is very often present in endemic dysentery, and cultures of *ameba coli* have developed the disease in lower animals. The course of dysenteric diarrhea is likely to extend over a few days or weeks, depending in good part upon the state of the health of the child attacked, upon the dysenteric features of the case, upon seasonal conditions, upon the character of the nourishment being given and upon the treatment administered. Epidemics occurring in winter weather and in malarious districts in the fall season of the year are sometimes difficult of management, individual cases resisting treatment extending over weeks. Sporadic cases, due to faulty diet, are usually promptly cured by change to proper food and by the administration of suited medication.

Treatment.—The treatment will depend in the first place upon a change of food. The nourishment should be of the blandest sort. If not contra-indicated for special reasons sterilized or at least pasteurized milk should form the basis. In youths boiled milk, milk and rice, the latter well done, burnt toast water, and various foods of like character are required. Nursing infants and young children may have to be kept on milk or on milk and Mellin's Food, barley water with or without milk, and in occasional instances Bovine or Valentine's meat juice until the health of the bowels has been restored. The abdomen should be dressed warmly by the addition of a flannel band or under vest, and the child should be kept as quiet as possible, the recumbent posture being insisted upon. It should be discouraged from straining at stool as much as possible. Its nourishment should not only be light and nutritious but should be limited in quantity, since the intestines are not in a condition to do their portion of their work in digestion, nor to assimilate the food when digested; hence it becomes a source of irritation in the canal and but increases the trouble. The more largely liquid the nourishment the better, in order that it may undergo stomach digestion and absorption and the intestines be saved their part of the digestive function. All the patient's drink should be boiled.

Especially should all its drinking water and water for its medicines be boiled.

The remedies called for in connection with dysenteric diarrhea are *Podophyllum*, *Antimonium crudum*, *Aloe*, *Cantharis*, *Nux vomica* and *Bryonia*.

Podophyllum is useful in cases characterized by yellow, watery diarrhea, occurring suddenly without effort; stools painless yet followed by straining, the straining being persistent; stools of mucus streaked with blood, the diarrhea being yellow, greenish or brownish and very watery. Weakness of the rectum and prolapse of the pouch call positively for this remedy.

Nux vomica has small, slimy, bloody stools, the tenesmus ceasing immediately after stool. The child is irritable and notional in appetite.

Mercurius corrosivus has cutting pains in the abdomen, with frequent discharges of blood and slime; stool attended by severe pain in the rectum, which continues after the stool has been voided. Its bowel difficulties are worse when the days are hot and the nights cool, the aggravations occurring after midnight.

Mercurius vivus has frequent discharge of blood or bloody mucus; stools look like clear mucus and scrambled egg mixed. Aggravations occur from midnight to three or four in the morning, and the pain is worse after stool than before or during it. The straining is not so severe as with the *corrosivus*, and diarrhetic features are more pronounced, the latter remedy being better suited when dysenteric symptoms are more prominent.

Cantharis has the tenesmus of *Mercurius corrosivus*, which in both remedies is apt to extend to the bladder. The *Cantharis* stools are like scrapings from the intestines streaked with blood, like little particles of flesh and mucous membrane rather than the mucous secretion from the membrane. There is dryness of the lips and thirst yet the child refuses drink when it is offered, crying for it but rejecting it.

Arsenicum meets diarrhetic cases that early run into dysentery and are attended by pronounced prostration with exceeding foulness of the stool. Great exhaustion after each stool, with face sunken, face pale and hippocratic.

Bryonia is almost specific for dysenteric diarrhea occurring in hot summers and early autumn when the days are very hot and the nights cool and damp. The condition comes on suddenly and the patient is fairly comfortable so long as he keeps perfectly quiet. The stools are brownish, gushing, watery, attended by much rolling and rumbling in the intestines, and painful at the finish; stools of brownish mucus, admixed with hard lumps of fecal matter.

Besides these remedies *Gummi gutti*, *Kreosotum*, *Petroleum*, *Dulcamara*, *China*, *Carbo vegetabilis*, and perhaps others may have to be considered.

Aloe has intense straining and frequent discharges of bloody water, or blood and jelly-like stool, aggravated from eating and attended by cutting and pinching in the rectum and loins.

China is especially adapted to dysenteric diarrhea occurring in malarial districts. I have found it an excellent remedy in recurring attacks associated with symptoms of recurring intermittent fever.

Iris versicolor is an excellent remedy in bilious dysenteric diarrhea when there is a good deal of vomiting and prostration, the stools consisting of bloody mucus mixed with brownish fecal matter, causing intense burning at the anus.

Pulsatilla, *Sulphur* and *Colechicum* will also be needed in individual cases.

CHAPTER LI.

ENTERO-COLITIS.

Definitive Considerations—Symptoms and Course—Complications—Distinctions—
—Etiology—Treatment.

Definitive Considerations.—Acute entero-colitis, or acute inflammation of the ileum and colon, follows nearly always upon the ordinary acute intestinal indigestion of infants, and is, therefore, really a secondary lesion. It is treated of under the title of chronic irritating diarrhea, chronic intestinal catarrh, and chronic entero-colitis, it being presumed that as a primary disease both the ileum and colon are sufficiently involved in the inflammatory process to make the ailment a conjoined one. It is rare that we find inflammation of the colon and ileum combined in primary occurrence. It is characterized by rise in temperature, change in the character of stools, frequency of their occurrence, abdominal distress and pain, and, pathologically, by hyperemia, infiltration and even ulceration of the mucous lining of portions of the ileum and colon. It occurs at any season of the year, and is not held by even the most enthusiastic supporters of the bacterial origin of disease to be due invariably to toxigenic germs. The bacteria already existing in milk or other food, and those ever present in the normal tissues, may act causatively when once the mucous lining is irritated by changes in the ferments and interference with the natural process of digestion. It is very much more common during the summer season, when foods, especially milk and artificial foods, are likely to be contaminated or infected by toxigenic germs, and is altogether more common among children who are deprived of the natural maternal nourishment. Children

possessed of the constitutional dyscrasie belonging to tuberculosis, syphilis or rickets, are more often the subjects of entero-colitis than children whose systems are robust. Children living in unsanitary surroundings, whose food is not wholesome, who live in dirt and filth and drink of impure water contribute largely to the mortality records of entero-colitis. Those whose digestion is naturally weak and who have been subjects of catarrh of the stomach and previous attacks of infantile diarrhea, not associated directly with their present ailment, are much more prone to develop acute inflammation of the living membrane of the intestines and colon than are children whose digestive apparatuses are vigorous and not previously affected by disease. It is much more commonly seen in summer seasons characterized by hot days and cool nights, and while not confined to the summer is yet rarely seen during the winter season.

Symptoms and Course.—If the child has been previously ill with simple diarrhea aggravation of the symptoms occur, fever sets up, the head becomes hot, the child becomes restless and fretful, its abdomen distended, it manifests colicky pains and the frequency of stools increases. If the attack comes on independently of previous diarrhea it may be ushered in with chilly sensations followed quickly by fever, and if from infective causes vomiting is perhaps the earliest symptom. Diarrhea that has been previously simple in character becomes more painful, and the stools show streakings of blood and mucus. The presence of mucus in the evacuations is almost always an indication of involvement of the colon. In some cases there may be but little abdominal pain or tenderness, but as a rule there is a great deal of distress. The odor is offensive, generally very distinctively so, even to putridity. Lumps of coagulated casein and particles of undigested food are intermixed with mucus and fully digested fecal matter. Occasionally pus is seen in the stools and they are quite frequently streaked with blood. They vary in color from pale, patty-like, even white, stools to the darkest green. Some days a great many occur within the twenty-four hours; then improvement will follow proper medication and diet for a time, aggravation recurring almost periodically, the case rarely presenting regularity of course. It may last over a number of weeks, and in individual cases children seem to progress wonderfully well in spite of the fact that they have chronic diarrhea in which both small and large intestines are involved, as shown by the character of stools and the location of distress, when any is present. In other instances emaciation occurs, the child loses strength, the stools increase in frequency, they get to be painful, the infant is less resistant, its muscles become flabby and wasted, its appetite is capricious, or altogether absent, and the case terminates fatally from slow starvation or exhaustion. In individual instances the appetite will remain good

throughout but no food that can be selected will seem to meet the requirements of intestinal digestion. Stomach digestion may be perfectly performed, children even exhibiting ravenous hunger; but the diarrhea continues and the undigested particles show evidence of the failure of the intestines to do their part of the work of digestion. In cases in which the general physical nourishment continues good it is because the stomach digestion and that performed in the upper part of the intestines is not interfered with, the disease being limited to the ileum and colon; but it is not often that the systemic state is up to par, or approximately so, even when the entire intestinal tract is not affected. In young children the simpler forms of stomatitis may be present during the course of enterocolitis but they are not usually seen. In others the teeth decay early and the skin becomes unhealthy; the child is emaciated and shrunk, the temperature is steadily above normal, and general infantile atrophy will follow. While not so commonly attendant upon this one form of intestinal disease as upon other varieties yet emaciation may be so pronounced that the child will be nothing but skin and bones, with swollen feet and ankles and general muscular flabbiness, death occurring from constitutional debility and general atrophy. In cases that do not respond to proper diet and medication directed to the intestinal canal it is safe to assume that some one of the constitutional dyscrasias is back of the case, hence the necessity for prescribing for the child rather than for its bowels. So commonly accepted is this fact in the homeopathic profession that it need not be elaborated upon, and even old school authors are beginning to draw attention to the necessity of taking the entire child into consideration. In the American Text-Book of Diseases of Children Vaughn calls attention to the necessity for a careful examination of the child in every part of its anatomy, suggesting that if attention is given exclusively to the bowels important conditions may be overlooked; the failure of the digestive organs to properly perform their function being often due to the existence of constitutional disease and the effect of poisons generated in the intestinal affection.

Complications.—Occasionally acute inflammatory processes are set up during the course of a case of sub-acute or chronic enterocolitis, with quickly fatal termination. These partake of the character of intense follicular inflammation, and all the symptoms of the disease already present are intensely aggravated, taking on more of the character of acute dysentery. The onset of these aggravations is usually sudden, dependent upon some radical change in the weather with exposure of the infant thereto, or due to unwholesome food or the introduction of bacteria from without in water or through the atmosphere. The temperature quickly mounts to three, four or five degrees above normal and there is incessant pain with quick prostration and, in fatal cases, acute fol-

licular perforations, sometimes within thirty-six to forty-eight hours.

Distinctions.—The classifications of different authors are somewhat indistinct. Some treat of acute entero-colitis following upon simple diarrhea as altogether a new disease, chronic entero-colitis following in turn upon its course. Others treat first of chronic entero-colitis as a sequel to or directly dependent upon simple infantile diarrhea, and not associated with the acute form of inflammation of the ileum and colon, which passes under the name of cholera infantum or summer complaint of nursing and teething infants. In this volume the simple diarrhea of infant life is first considered. Acute entero-colitis may occur idiopathically or may follow upon the former disease. Chronic entero-colitis, more strictly speaking, immediately follows the acute form of inflammation as a sequel to simple diarrhea. Since the distinctions are admittedly confusing it must be borne well in mind that the passage of one disease into the other is not always characterized by distinct symptomatic manifestations that make its physiognomy clear. But after all, for purposes of treatment, this is not a very essential point since dietetic and hygienic rules that apply to one of the varieties of gastro-intestinal disturbance apply equally to all, and since medication is directed to the symptomatology rather than to the supposed pathological states.

Etiology.—In its more malicious manifestations acute entero-colitis destroys thousands upon thousands of children every year. It prevails much more extensively during the hot months, and especially during hot terms lasting over a good period of time; more when the weather is sultry as well as hot than when it is hot and dry. It has long been looked upon as one of the most fatal diseases of child-life and has been attributed to the depressing influences of heat, the irritating effects of teething, the two combined, and also to changes that occur in the maternal milk or other infant food in consequence of very hot weather. Sporadic causes may arise directly from violent maternal emotions, especially anger, though grief and fright may also disturb the maternal milk to such degree that it will act deleteriously and set up acute cholera infantum. Excessive indulgence in the sexual habit during lactation, and also the early oncoming of menstruation while nursing, abnormalities in menstruation, and various maternal illnesses excite individual cases. In a general way, however, it has come to be pretty well understood that a more common cause of the summer diarrheal diseases of infancy than all these is the presence of specific micro-organisms in the food which renders it unfit for use and classifies the disease as one of the acute infections. Its greater prevalence in the hot weeks of summer, so long been attributed to the depressing influence of heat, is doubtless due in great part to this cause. But it is

being held, and with some degree of reason, that the physical influences that so suddenly depress the vital forces of the infant, act deleteriously also upon the maternal milk supply, and especially upon artificial foods. In treating of cholera infantum Vaughn in the American Text Book of Diseases of Children, ascribes it invariably to an acute milk infection, and classes entero-colitis in the same category, treating of the latter disease as sub-acute milk infection. Milk poison is dependent upon the presence of tyro-toxicon rather than upon bacteria belonging to this disease alone. As has been shown in the chapter on infantile feeding milk, which forms the basis of food of so large a per cent of children who are subject to attack of entero-colitis, contains a number of varieties of bacilli. In some as yet unexplained manner these milk bacilli bring about contamination of the milk during hot weather, multiply very rapidly and by their presence set up the gastro-intestinal diseases belonging to this period of life.

Bacteria which are responsible for sub-acute milk infection, or the disease under consideration, are held to be less powerfully toxic than those causing true cholera infantum. Many observers are of the opinion that this ailment is excited not alone by the presence of bacteria in the milk, nor by the effect of heat upon the infant, but by the direct effect of the hot weather upon the milk, causing it to sour and develop an excess of acid, which, in turn, irritates the mucous membrane of the stomach and bowels and incites the various diarrheal diseases. It is not at all unreasonable to presume that all these influences have their bearing upon the summer complaints of children. In a very critical paper on the subject of the etiology and pathology of diarrhea in children, recently read before the Homoeopathic Medical Society of Chicago, Prof. Cobb, of Hahnemann Medical College, held that micro-organisms play an important part in their production and that the relation of these organisms to foods and the changes produced in foods by their presence and growth are of more moment to infants and children than to adults. While filth, poor ventilation, imperfect sewerage, unsanitary surroundings are held by him to predispose to this disease his contention is that observation has demonstrated the frequency of entero-colitis in such surroundings to be indirectly due to the contamination of the food by the absorption of toxic germs from the filth-laden air. It is therefore highly important that children of susceptible age be given the benefit of the very best possible sanitary surroundings, and that every precaution be taken in the preparation of their food to guard against the introduction of offensive bacteria, in themselves so productive of this disorder. If this precaution be exercised the two important factors of unsanitary environment and infection from without through food will be removed. The third most frequent cause and perhaps the most common of them all, climatic

influence, as sudden thermal changes like intense and prolonged heat and humidity, is much more difficult to avoid. This has to be met by change from the hot city to the cooler country districts, or an even more radical change of climate, as to the mountains or sea shore; but it must be borne in mind that these are not always possible among the poor classes, in which event we turn hopefully to the advantage of open parks and boulevards in large cities, to hot weather excursions on the water and to other philanthropic and hygienic efforts to so fortify the system against this unavoidable factor that it will be able to withstand the hot term, and thus reduce the mortality from entero-colitis and allied disorders to the minimum.

Treatment.—The remedies that will be needed in the treatment of entero-colitis are identical with those that will be exhibited in the treatment of cholera infantum and will be discussed in connection with that topic on pages 485 et seq.

CHAPTER LII.

CHOLERA INFANTUM.

General Considerations—Etiology—Diagnosis—Prognosis—General Treatment—Hygiene and Diet—Medication.

General Considerations.—Cholera infantum is, correctly speaking, an unusually acute manifestation of gastro-intestinal catarrh in young children. It comes on suddenly, with great violence, without previous warning, and if the term be used in its strictest sense is a very different ailment from the ordinary entero-colitis of children, with which it is often classed. It might very properly be classified, for purposes of description, along with the cholera that attends upon epidemics of true Asiatic cholera. It is not necessary that a child should previously have had infantile diarrhea or entero-colitis to develop the regular summer complaint, under which name this disease has long been known. Confusion obtains just here because of the misappropriateness of this term. "Summer complaint" covers a great many gastro-intestinal diseases of child-life; acute cholera infantum is a disease per se, and should not be associated with the ordinary intestinal dyspepsia and severe forms of entero-colitis. While the latter are quite severe enough, and are attended by a large mortality, typical cholera infantum is much more violent and its mortality is far in excess of that belonging to other forms of intestinal disease as manifested in their acute stages. Fortunately cholera infantum is not a common ailment. Given a large number of cases

of acute bowel disorders in early child-life, even during hot summer weather, and but few will prove upon careful differentiation to be typical infantile cholera. Its onset is always violent. It occurs only during the very hot weather, usually among children who are artificially fed and those who are teething. It is ushered in by vomiting or purging in children who are apparently perfectly well. There may have been a prodromal stage of a day or two, during which time the infant seemed cross and fretful, its teeth hurting it and some signs of abdominal tenderness being manifested. But usually the first indication of the oncoming of cholera infantum is sudden, spurring vomiting, attended quickly by gushing diarrhea, usually uncontrollable and followed by early collapse. The stools are not only profuse and frequent, but soon change from a watery diarrhea containing fecal matter, yellowish or brownish in color, to a thin, serous, watery discharge, very like the rice water evacuation of cholera in the adult. Perhaps the first few stools the child passes after the initial vomiting may be of fecal odor, but this soon disappears and they are finally odorless or have an albuminous smell. Instead of being acid, as in infantile diarrhea, the serous stools of cholera infantum are alkaline in reaction, sometimes intensely so, with chafing of the anus and raphe as a result. The violence of the onset of cholera infantum is remarkable, and the degree of prostration that will be seen in an infant perfectly well but a few hours before is characteristic of this as of no other disease of child-life. From a happy, plump, well-nourished infant of a day ago will be seen a collapsed and prostrated child, with features sunken, face drawn and pinched, the fontanelles depressed and the skin fairly ashen in color. The pulse is exceedingly rapid and feeble, the anus lies relaxed and open, and because of the outpouring of serum from the blood the mouth and tongue are dry and the thirst insatiable. The surface of the body may be cool, even cold, and clammy, while the thermometric range of the rectum shows an elevation of several degrees, even to 106° or 107° . A peculiar feature in this connection is the fact that there will, oftentimes, be a difference of four or five degrees between the axillary and rectal range. Not infrequently death may occur in cholera infantum within twenty-four or thirty-six hours of the first manifestations of the ailment. In other cases ending fatally, the child's powers of resistance being greater, it may drag along three or four days, the case becoming more and more pitiable with each succeeding hour. Convulsions not infrequently attend, especially in children who are cutting a mouthful of teeth; the head is intensely hot, the pupils widely dilated, and boring of the head in the pillow or rolling from side to side is often seen. Acute hydrocephaloid manifestations occur with many of the gastro-intestinal disorders of teething infants, but especially characterize cholera infantum.

proper. It is in children nervously predisposed that the temperature is apt to be extreme and the nervous symptoms pronounced, even to convulsions. Lymphatic children are more likely to show profound prostration without nervous exaltation, and to sink into a relaxed and collapsed condition, passing on into drowsiness and coma. In occasional cases the infant will lie in a comatose state for two or three days, being apparently unconscious to all its surroundings, its only manifestations of life being in the fact of its breathing and of the occasional action of its bowels, attended by feeble efforts at straining. It may remain in this condition two or three or four days without signs of improvement, when, if recovery is to take place, it will become gradually more conscious of its surroundings and efforts at stool will be less frequent. If the temperature has been high it will begin to decline, and if collapse and coldness of the surface have characterized the case improvement will set in in these respects, with gradual return of warmth and restoration of functions. If of the convulsive type these will subside, the nervous tension will be relieved and the child gradually passes into recovery, exceedingly prostrated from the severe attack upon its nervous vitality.

It is remarkable how quickly a plump child will emaciate in this disease; out of all proportion to the amount of loss from the bowel and stomach will be the degree of emaciation. Within twenty-four or thirty-six hours a child will have fallen from a plump, healthy infant of twelve or fifteen pounds' weight to an emaciated, wan, collapsed child scarcely able to breathe, debilitated to the last degree and but little more than skin and bone. There seems to have been an emptying of all of the fluids of the body that could be spared and the child yet live. The skin hangs in loose, baggy folds over the arms and thighs, every rib in the body shows, the abdomen is sunken and collapsed and the skin is drawn tightly over the facial and cranial bones. In individual instances with the first severe manifestations of cholera infantum the child becomes cold over its entire surface, its face sunken and features pinched, and it will lie in a stupor with its eyes half open and apparently covered with a film, never arousing from this comatose, rigid condition. In other instances the abdomen is enormously distended, and the vomiting and purging will suddenly cease, the gastro-intestinal indications being greatly for the better, but metastasis of the inflammatory process occurs in these cases and convulsions of the hydrocephaloid type are almost sure to follow quickly.

Etiology.—Cholera infantum occurs only in exceedingly hot weather, and generally when the weather is humid as well. It occurs only among teething children, except that occasionally an infant who has not begun to cut its teeth through the gums will succumb to it; but it must be remembered that even in this case

the teeth are in eruptive process, occupying their place in the maxilla at the time of birth. We may not see them coming through the gums but they are building and developing nevertheless. There is no question but that the tax upon the brain and nervous system due to a disturbance in the relative proportion of physiological proximate principles, as they relate to the brain and nerves, operates as a predisposing factor in the manifestations of the disease under consideration. There is no doubt, further, but that the depressing influences upon the nerve centres of sudden and intensely hot weather, coupled with a degree of humidity that depresses the vital forces, has its direct influence in the production of this disease. These two factors are so invariably associated with cholera infantum that it seems to be folly to attempt to eliminate them from its direct etiology. Recent authors are attaching more importance, however, to food and the introduction of noxious bacteria as the cause of cholera infantum. Vaughn attributes cholera infantum directly to milk infection. He asserts that it practically never occurs in children fed exclusively from the breast, and suggests if there be exception to this rule such cases must arise from the introduction of powerful toxicogenic germs in the alimentary canal in some unusual manner. The last clause of this statement affords much room for speculation. Cholera infantum does occur and that very often in children fed altogether from the breast. I have witnessed many such cases, and am sure they occur in the practice of every practitioner of extensive experience. While much more common to children living in hovels and unsanitary parts of large cities, and in those fed upon artificial foods, yet cholera infantum invades the best homes, carries off the brightest and healthiest children, and in far too many cases those sustained upon the maternal milk. Vaughn goes so far as to suggest that children fed at the breast may infect themselves from their toys or by touching infected objects and then sucking their dirty fingers. These constructions appear to be greatly strained. Even admitting that toxicogenic germs are very often the cause of cholera it is not to be gainsaid that the powerfully depressing influences of sudden and intense heat, lasting over a number of days in succession, are wonderfully effectual against the infantile organism. It may be true that they affect the food as well as the child, but it is also true that they affect the child as well as its food. In numerous instances I have known infants to be fairly melted out of existence during intensely hot weather without manifesting over-violent disturbances of the gastro-intestinal tract, and also without developing the cerebral type of cholera infantum belonging to the suppression of the intestinal secretion.

The irritation of dentition so depresses the sympathetic nervous system that intestinal reflexes are very common. In too

many instances the prompt relief of entero-colitis and even of cholera infantum is witnessed coincidentally with the appearance of the teeth through the gums to allow disassociation of the conditions, and gum-lancing has too long been successfully practiced in individual cases as a method of treatment for children in convulsions in association with cholera infantum to entirely disconnect the two.

While not disposed to view this procedure as possessed of the importance that is given it by some authors I confess to having witnessed such certainty of relief following upon its practice from the nervous manifestations attendant upon cholera infantum, and even from the gastro-intestinal manifestations of the same, that it is to me confirmatory evidence of the relation of the two conditions and fully justifies the procedure in cases in which it is clearly demanded.

Admitting that choleraform diarrhea results in a large proportion of cases from milk poisoning, and from the development of toxogenic bacteria in artificial foods, it is at once seen that the greatest of care must be exercised all during infant life in the preparation of its nourishment. The cow from which the milk is obtained for an infant relying upon food from such source must be healthy; her food must be of the best quality, free from the refuse of breweries and swill barrels; the water she drinks must be wholesome, free of noxious weeds, and not from stagnant pools or low running streams; and, as already stated in connection with artificial feeding, the cow should have her regular exercise, her stall and stable should be kept in a wholesome condition and her milk should be pasteurized. If proprietary foods are relied upon they should be obtained fresh and pure, never allowed to become musty or old, and the nursing bottle or other vehicle in which the food is prepared and from which it is administered should be so absolutely cleansed by thorough boiling after and before each using as that it will not be possible for the child to become infected from this cause. The sanitary condition of all homes in which infants are being reared must be perfect, and in large cities careful attention should be paid during the hot weather to the streets, alleys and vacant premises.

Diagnosis.—The symptoms and course of cholera infantum have already been pretty well described. There is only one disease with which it can be confounded, that is, Asiatic cholera. When the latter is prevailing epidemically it is wholly impossible to differentiate the two diseases. It should be borne in mind, however, that the one is intensely infectious while this is not yet proven of infantile cholera. Bacteriological examination of the stools will show the characteristic bacilli of Asiatic cholera when this prevails, and thus determine the difference; but the physical symptoms of the two diseases in children are so like that it is im-

possible to tell them apart. The suddenness of the onset, the vomiting and relaxation of the bowels, the serous discharge, the quick collapse and hippocratic countenance all point alike to cholera infantum and Asiatic cholera. Even the high temperature that obtains in cholera is present in the Asiatic disease. It is hardly necessary to speak of the differentiation of cholera infantum from sunstroke. The prostration from the intense heat is the same, but in the latter the application of the sun's rays must be direct. Children who are old enough to play in door yards or streets may suffer sunstroke, but there is not likely to be the same degree of purgation and vomiting. The prostration and the sudden rise in temperature may be very much alike, but the symptoms of cholera infantum are sufficiently characteristic to distinguish it.

Prognosis.—The prognosis of genuine cholera infantum is always grave. Its subjects are of such tender months or years and the effect of the intense heat upon the brain and nerve centres is so great that it is one of the most common causes of death in infancy. When to this is added the probability of milk-poisoning it will be seen that the system has more than it can bear in most cases. Under old school treatment the usual termination is death. Under homoeopathic treatment the prospects are bad enough, but brighter. The more persistent the vomiting and purging and the more profound the impression upon the central nervous system, as shown by delirium or convulsions or by stupor and coma, the greater the likelihood of a fatal issue. Sudden suppression of the stools with coincident appearance of cerebral disturbances augurs badly. If the degree of collapse has been very profound and the alidity unusually severe, so that the vitality is depressed at the very onset of the attack to an unusual degree, reaction is rare. If the child succeed in withstanding the first shock of cholera infantum it may recover. Secondary disturbances of the gastro-intestinal canal are not as likely to follow upon acute cholera infantum as upon acute enterocolitis; and while it may be many months in regaining its original vigor, during which time the teething process will be more or less interfered with, and be the cause of recurring attacks of nervous and febrile disturbance, as also of occasional gastric irritations, its chances of recovery are very good.

General Treatment.—There is usually little opportunity for prophylactics in connection with cholera infantum. The disease is so sudden in its onset and so universally attendant upon the extreme heat of summer that only in a general way is it possible to apply the advantages of sanitary science. With the certain knowledge that the summer season is attended with unusually high death rate from the bowel disorders of children it is imperative that all advantage of improved sanitation of cities and individ-

ual premises be availed of early. Mortuary records show a greater prevalence of the disease in unsanitary locations. In a general way streets, alleys and back premises should receive the attention of sanitary inspectors and street cleaning forces with the earliest approach of hot weather. Individual premises should be put in perfect condition. All offensive drains, vaults and pools should be emptied and chemicalized by the free distribution of lime or corrosive sublimate. Rotting vegetables, rank growth of weeds and grass in yards, reeking manure piles, carcasses of animals in either city or country should be destroyed or buried. If summer weather is attended by hot rains the drainage of individual premises should be made as perfect as possible, since heat and moisture together conduce more to the development of cholera infantum and other gastro-intestinal diseases of child-life than either alone.

HYGIENE AND DIET.—Special care in relation to diet is necessary. Teething children should not be allowed to partake of a mixed diet during hot weather nor of fruits nor of vegetables, especially. If at all possible they should be removed to the country during the heated term, and if this be out of the question, as with the children of poor parents, the parks and breathing places of cities should be availed of as much as possible. In a recent special number of the *Medical Century* it is the testimony of physicians from every portion of the United States that the sine qua non in cholera infantum and other summer bowel disorders is fresh air and plenty of it. The country districts are preferable; next the open yard and shady places are better than indoors. In the long summer season of the South it is often the practice to have the sick infant out of doors during the whole of the twenty-four hours, with the exception of the hottest hours of mid-day, and even then this is quite the rule in the practice of many physicians in the treatment of sick children if they can be kept in the shade. What has been said in relation to cow's milk applies equally to all foods. The infant nursing at the maternal breast has by far the best chance for its life if care be exercised on the part of the mother, but if she be careless in her habits and diet, partaking of improper foods at unreasonable hours, and otherwise dissipating and violating the laws of health, her infant is quite as likely to suffer from cholera infantum as the bottle-fed baby whose nurse exercises reasonable care in regard to its diet. If young children are kept comfortably cool through the hot term, are given only pure, fresh foods, plenty of sterilized water, and kept in the fresh air during the greater part of the twenty-four hours, they are almost certainly safe from cholera infantum. On the other hand, confine the young child to the foul air of the city, on premises that are unsanitary, keep it in a hot house, be careless in regard to its food, and its chances for developing fatal cholera infantum are greatly improved. But little can be done in a general way to guard against seasonal influ-

ences, but when these are on or are seen to be approaching, very much can be done toward improving local sanitation, and by giving the child the best possible advantages much may be accomplished in the way of prophylaxis.

Regularity of feeding is important. Carelessness in this respect is always attended by danger, and especially when the summer bowel disorders of children are prevailing will it be necessary to exercise intelligence in this respect. Very young children should have their nourishment not more than once in two and a half or three hours, with a season of perfect rest of the stomach between feedings. Older children may be fed once in four hours. The quantity given at a feeding should be within the limits of reason. Frequent feeding or irregularity in administering food, and excessive administration of nourishment are among the most common causes of gastro-intestinal disturbances; and while they are not sufficient in themselves to set up cholera infantum they may so disturb the vital equilibrium that the immediate operating causes which produce these diseases are much more likely to have their effect. It will not often be found safe to change the infant diet when cholera infantum is fairly on. In fact such a procedure is usually useless, since the patient is rarely able to take nourishment or to retain it if taken, this constituting one of the greatest dangers in cholera infantum. There is unusual loss of fluids from the system with often little chance to compensate therefor. The patient is very thirsty and sterilized water may be given *ad libitum*. This alone seems sufficient to sustain life over a good period of time in cases in which recovery is possible. Nourishment may be added to the water in the way of carbonized bread or well done toast, or a small portion of pasteurized milk may be added to sterilized water if the child is able to retain nourishment at all. It is sometimes beneficial to administer water impregnated with flour which has been thoroughly cooked in the way of a flour ball, a teaspoonful or two of flour being tied in a cheesecloth and boiled two or three hours until it is hard and crumbly. This may be added in small quantities to the water the child drinks and thus some little nourishment be afforded. The broths of fowls or meat are not permissible at all, nor is rectal alimentation possible because of the outpour of serum from the intestinal tract; in fact the system is not in an absorbing state and even though considerable quantities of nourishment be given *per os* they only serve to irritate. Stimulants are not permissible, although the surface indications seem to demand them. I have only found their use to further irritate the child, increase the fever and add to the tendency to convulsions and high nervous tension. During convalescence from cholera infantum beef peptonoid water may be given almost *ad libitum*. At regular hours barley gruel, rice water, Mellin's food and powdered

meat-pulp may be given with caution, unless the child is nursing at the breast, in which event no food beyond the mother's milk should be administered for many weeks or until it has completely regained its strength and nervous vigor. If stimulants be demanded at all it is best to administer them in the form of wine whey or by local application, saturating a small piece of lint in equal parts of whisky and warm water and applying the same to the folds of the groin or under the armpits. During the state of collapse, especially if alidity is marked, inunctions of hot olive oil are beneficial. The child may be bathed in hot oil or wrapped in flannel well saturated with it from head to feet, or oiled cloths may be laid across its chest and over its abdomen reaching well down on either side. In special cases it may be well to use the inebriator or the continuous hot bath, especially if the child's body and limbs be cold and its head hot. The application of ice water or ice bags to the head is not justifiable. I have witnessed numerous fatal cases from this cause alone, ice having been kept continuously to the child's head over a period of a day or two, the fontanelles being still open and the cranial bones so thin that sudden chilling of the brain tissue recalled. If convulsions threaten or the head is very hot cloths wrung from water cooled by ice may be applied for hours at a time with benefit. If the hot bath is resorted to the head should be kept cool in this manner. Water may be given ad libitum and small bits of ice are sometimes grateful, though usually thirst is but increased by them. If the bodily heat is very intense and convulsions threaten the cold pack is one of the best measures that can be resorted to. In this as in all other infantile illnesses attended by great elevation of temperature I have found it one of the most valuable of aids. It is superior to all the antipyretics that may be used, and I have never seen harm result from it; on the contrary its benefits are great and its comfort to the little patient is so pronounced that after the first shock no further resistance is offered to its use. When once the child is put in a wet pack or wrapped in wet sheets or towels water should be added by being poured on them; thus avoiding chilling of the body during change of the pack. In hot weather this is not very essential, and it may be more desirable to renew the pack fresh from the bowl or tub.

MEDICATION.—The remedies that will be found most useful in the treatment of cholera infantum are those that affect the brain and nervous centres rather than the gastro-intestinal canal. *Aconite*, *Belladonna*, *Gelsemium*, *Glonoinum*, *Ferrum phosphoricum*, *Veratrum album*, *Lachesis*, *Helleborus*, *Cicuta*, *Arsenicum* and *Phosphorus* constitute the list from which we will usually have to select the simillimum. Besides these *Podophyllum*, *Oleander*, *Croton tiglium*, *Pulsatilla*, *Carbo vegetabilis*, *Jatropha*, *Iris* and *Secale* may be called for. *Arthura* must not be overlooked, and

Eletarium will occasionally be found a remedy of great importance.

Aconite is not often called for in cholera infantum, but may be found very useful if the case is ushered in with a chill, followed immediately by high fever, the attack being due to taking cold during cool summer nights, especially from exposure to chilly, raw winds while heated, as occasionally happens from a sudden fall of temperature in summer and consequent suppression of perspiration. It is the general *Aconite* symptoms that will be proscribed for. Full, hard, quick pulse, general heat of the body and head, restlessness and intense thirst, the stool being small, slimy and tinged with mucus or blood from the start. It is more suited to dysenteric states than to cholera infantum proper, yet I have found it to relieve the high nervous tension of asthenic cases.

Belladonna best meets the cerebral types; stools are of yellow, slimy mucus; or of thin, green mucus; worse in the afternoon; pains are pinching; with stool there is shuddering and straining, the straining continuing after stool; the head is intensely hot and face either very much flushed or very pale; rolling of head from side to side; delirium; tongue dry and red; child starting suddenly with partial or general spasm; the pupils are dilated; applicable especially to suppression from opium, with hydrocephaloid symptoms.

Gelsemium is also especially adapted to the cerebral type. Its bowel symptoms are of little or no consequence, but with opisthotonos, rolling of the head, convulsions, general fever, difficulty in swallowing, delirium and apathy it is a most excellent remedy. I have found it more useful in the cerebral type of the summer complaints of children than *Belladonna*, though the latter is more applicable when the case occurs with great suddenness and violence.

Ferrum Phosphoricum is very much like *Gelsemium* in its symptomatology as it relates to fever and the brain symptoms, excepting that it is less likely to have convulsions; the head is hot, temperature 104 or 105 degrees, child's skin hot and dry, but the patient not as restless as with *Aconite*. The stools are yellowish-green, especially dark green with streakings of blood. It is not called for in the rice-water discharge of true cholera, but is one of the remedies to be thought of for the brain congestion and high fever of acute summer complaint.

Veratrum album corresponds to the choleraic type. Great suddenness of attack, sinking of strength and collapse of the abdomen; profound prostration; paleness, cold sweat on the forehead; nausea, vomiting and great weakness during stool; greenish, watery stool, with whitish flakes; stools frequent, profuse, very watery; violent cramps of the extremities, skin blue and cold; violent thirst for large quantities of cold water; vomiting of froth; great weakness after vomiting. *Veratrum* is of no value in painless

cases, but is a remedy of great importance when with the outpouring of watery liquid from the intestines and general symptoms of collapse there are pain and cramps, either in the legs or abdomen.

Arsenicum is more useful after the first stage is passed, unless the case comes on with suddenness with a combination of vomiting and diarrhea and great prostration, quickly presenting the *Arsenicum* picture. Its aggravation is after midnight. Great prostration is its chief characteristic, with restlessness, angriness and tossing. Face pale, earthy, death-like; deep rings round the eyes; mouth dry and hot; exhaustion coming very rapidly; quick, feeble, scarcely perceptible pulse, with emaciation showing so rapid as to be startling; child drinks greedily, throwing up the water as soon as it has reached the stomach; or it drinks often, simply wanting a sip to moisten the mouth. As distinguished from the *Vibrium* prostration that of *Arsenicum* has associated with it intense restlessness and tossing.

Phosphorus is suited to subjects of tuberculous antecedents in whom the diarrhea is gushing and profuse, the system being so relaxed that the anus stands open, the stool pouring away from it as from a hydrant; white, watery stools, with little grains like tallow or particles of curdled milk intermixed; green mucous stool; hot involuntary action, passing with force; sudden urging to stool; pale, sallow, changeable color of the face; vomiting of what has been drunk as soon as it becomes warm in the stomach. For the hydrocephaloid case attended by relaxation of the bowels and sympathetic nervous system I have found *Phosphorus* a remedy of much value, though it is not down in the list of cholera infantum remedies as usually enumerated.

Helleborus is another hydrocephaloid remedy, rarely useful in the initial stage but almost always needed at some time during the course of acute cholera. It is especially applicable during dentition when the stools are white and jelly-like, but it is the brain symptoms especially that will call for it. Boring of the head back in the pillows, rolling of the eyes, either convergent or divergent strabismus; head intensely hot; pupils dilated; gushing vomiting, the characteristic brain vomit; vomiting of green or blackish substance calls for this remedy, as do also white, jelly-like mucous stools, consisting almost altogether of tenacious mucus. The spurring vomiting and boring of the head are symptoms that will always suggest *Helleborus*.

Cicuta is limited in its applicability to the spasms of children in dentition; sudden convulsions, general in character, involving the entire system, coming rapidly, the result of abdominal pain or of painful stools, or continuing persistently from the irritation of teething. It has but little bearing upon the gastro-intestinal condition but is exceedingly useful as a concomitant remedy for the cerebral and general convulsions.

For the outpouring, watery, choleraic stools of summer complaint *Podophyllum*, *Oleander*, *Croton tiglium*, *Jatropha* and *Elaterrum* are most applicable. The *Elaterrum* stools occur suddenly, they are frothy, watery and of a pea-green color, possessed of or attended by cutting or gripping pains in the bowels. The stomach is not disturbed, the force of the attack being spent upon the intestinal tract, the stools being exceedingly gushing and watery and followed by great prostration.

Podophyllum has profuse and gushing stools, very offensive, smelling like carrion. It is suited to painless cholera morbus as against *Veratrum album* for the painful variety of this disease; gagging or empty retching with sudden gushing stools.

Jatropha is suited to cholera or cholerae before collapse sets in; watery diarrhoea, contents of the bowels gush like a torrent; vomiting of large quantities of watery substance like albumin; abdomen flattened and collapsed, though the general symptoms of collapse are not manifested where this remedy is called for. It is like *Veratrum* but for this difference. Rumbling and noises in the abdomen as of watery stool passing through the intestines; torrent-like stools and the vomiting of large quantities of watery liquid are *Jatropha's* characteristics.

Oleander has spurting stools coming early in the morning, with rumbling in the abdomen; pale, sunken face with rings round the eyes. Its indications are not so characteristic of acute cholerae as those of *Jatropha*, *Podophyllum*, *Veratrum* and *Elaterrum*, but it has an occasional place and serves an excellent purpose.

Croton tiglium has even more forcible evacuation of yellowish, watery stool than *Podophyllum* or *Elaterrum*; sweat during stool, weakness and fainting with violent action of the intestines, ejecting watery stools with great force; sudden attacks of vomiting which are equally violent with the action of the intestines; liquids pouring with great force from the mouth and anus simultaneously.

Camphor is applicable to cholerae, as to cholera in the first stage, when there is sudden overwhelming prostration, cramps in calves of the legs with coldness of the whole body; rice water stools. The force of this remedy is spent upon the sympathetic nervous system; severe shock and great prostration of the sympathetic without corresponding activity of the intestines.

Carb. vegetabilis is to be thought of in the algid state where there is extreme collapse; nose, cheeks and finger tips cold; cold breath and cold tongue; patient sunken, collapse profound.

China is suited to the prostration following upon the loss of vital fluid from copious stools and excessive vomiting. Will not often be useful during the active stage but is very helpful for the prostration and debility resultant upon the rice water discharges which deplete the system.

Aetna is a remedy of first importance in cholera infantum. Its case comes on with violent vomiting of curdled milk, with copious discharge of bilious, light yellowish or greenish liquid stools. Spasms occur early; thumbs are clenched, eyes turned downward, pupils dilated; the eyes stare; child foams at the mouth; trismus occurring during cholera infantum. The *Aetna* case comes suddenly, and the vomiting of large curds and clenching of the thumbs and downward rolling of the eyes are its characteristics. *Piorium*, *Sulphur*, *Sepia*, *Mercurius*, *Ipecac* and *Tabacum* will be needed in special cases.

Ipecac, *Tabacum* and *Iris* will often be required when the stomach suffers most; vomiting is extreme and prostration depends more upon sick stomach rather than the condition of the bowels. *Ipecac* meets the green stools of the second stage of cholera infantum.

Cuprum may be needed for violent cramps in the abdomen and calves of the legs and feet, spasms of the extremities with extensions and rigidity of the feet.

Apis will be thought of in association with *Helleborus* and *Belladonna* for brain involvement; sharp, piercing screams, shrill shriekings with hydrocephaloid condition.

Irrigation.—The excessive loss of fluids from the infantile system in acute cholera infantum may be in part compensated for if the intestines will retain enemata, by copious effusions of clear water after every choleraic discharge or the infusion of water impregnated with from two to five per cent. of pure table salt. In order to facilitate retention the child's hips should be elevated and its trunk somewhat lowered, laying it on its right side. From a pint to one and a half or two pints of water of moderate temperature that has been sterilized previously and to which a pinch of salt is added may be injected by a fountain syringe or other intestinal pipe. Even if it is rejected it assists in washing away the debris from the intestinal tract and very often the intense thirst is relieved by the absorption of some of the water thus administered. The saline effusion compensates in part for the loss of blood serum and should be very freely practiced. In occasional instances enema should be made mucilaginous by the addition of flaxseed water or slippery elm water, but as a rule plain water or plain salt water is best suited. Not only should water be given by enema but the child should be allowed to drink as freely as it will, unless the administration of water per os results in continued nausea and vomiting. It is cruel to deny a thirsty child all the cold water it needs. Ice water should not be used either in sickness or in health in infant life, but cool, refreshing water in plenty should be administered to all sufferers from cholera infantum. Clinically I have found the use of copious enemata of water to overcome congestion of the brain, it seeming to determine the



FIG. 1.
PNEUMOCOCCUS



FIG. 2.
BACILLUS CHOLERA



FIG. 3.
STREPTOCOCCUS



FIG. 4.
PSEUDO-DIPHTHERIA BACILLUS 1000 X.
CULTURE



FIG. 5.
STAPHYLOCOCCUS PYODERES ALBUS



FIG. 6.
DIPHTHERIA BACILLUS 1230 X
KNAP



FIG. 7.
BACILLUS TUBERCULOSIS



FIG. 9.
PSEUDO-DIPHTHERIA COLONIES



FIG. 8.
DIPHTHERIA COLONIES



FIG. 10.
BACILLUS TYPHOSUS

blood from the brain to the abdomen. Colon flushing should not be forgotten in all choleric cases that are characterized by intense heat. The system will absorb a great deal of water in this way, and thus the destruction of its liquids is compensated for in part at least. In special cases, in order to promote its ready absorption, hot water may be used instead of cold or cool. It is not advisable generally to medicate it with carbolic acid, Dobel's solution or other germicide, the object being simply to supply the waste of serum by absorption, to cool the heated tissues and wash away intestinal debris that may be irritating. Irrigation should be practiced systematically. The child should be laid on the nurse's lap with its head a little lower than the hips, the lap being covered with an oilcloth or rubber apron emptying into a vessel on the floor, the fountain being elevated to sufficient height for the water to flow freely and raised or lowered as necessary, according to the comfort or discomfort of the patient. Even though the water pours away as fast as administered it is well to keep up continuous irrigation over a number of minutes, using as much as two or three quarts in order to secure thorough emptying of the intestinal tract, the soothing influence of the heat, if hot water is used, and to secure absorption of as much as possible.

CHAPTER LIII

DYSENTERY.

General Considerations—Acute Catarrhal Dysentery—Diagnosis—Symptoms and Course—Prognosis—Amebic Dysentery—Symptoms and Course—Diphtheritic Dysentery—Symptoms and Course—Chronic Dysentery—Symptoms and Course—Treatment—Diet—Adjuncts—Medication.

General Considerations.—As distinguished from the bowel disease just described dysentery is a pathological affection of the mucous membrane of the colon and rectum, without inflammation or with but slight inflammation of the smaller intestinal tract. It is a common disease and frequently a very fatal one. It is especially severe in the tropics, and is seen more frequently in the Southern part of the United States than in the lake regions. It shows in different forms as acute catarrhal dysentery, the tropical or amebic, the diphtheritic and the chronic dysentery. The acute varieties occur sporadically, endemically and epidemically. Certain localized sections of country are subject to their visitation every year. In others they seem never to be absent, while in yet others they appear sporadically only, except under specially unsanitary conditions, when they may be seen anywhere

as an epidemic, even in the extreme North. Dysentery also appears as a camp disease, is very common in connection with wars, railway camps, among the Indians and in humbler quarters of cities, along river banks and in rich alluvial lands. Thus it will be seen it is not at all limited to child-life, though occurring so frequently among children that its consideration in this volume is demanded. In the author's experience in malarious districts children from two to five or six years of age were found especially subject to it. While as a rule the dysenteric form of diarrhea is more apt to manifest itself in early child-life, yet in certain seasons of the year with children who have passed beyond the teething period epidemics of acute dysentery occur without previous presence of intestinal irritation.

The burden of testimony goes to show that dysentery is often due to impure water. I have observed that it is especially present among people who live in droughty sections of the country, who rely upon ponds, artificial tanks, surface cisterns, or sluggish streams for their water supply. These are especially the subjects of this disease, whether adults or children. Adams reports an epidemic in which at least fifty children contracted dysentery from drinking water from an impure well. Unripe fruits or fruits out of season, also cause it. Vegetables that are not thoroughly cooked, unwholesome candies and other unwholesome diet may induce the disease. Sudden changes in temperature, as a cold rain coming up quickly on a hot day, and the unusually cool nights following hot summer days induce the disease. In children it occurs especially among those living in ill-ventilated sleeping apartments, and in children of constitutional dyscrasia, as those who are tuberculous and those whose unsanitary surroundings and general hygiene are unusually bad. It is seen in infant life, more especially during the period of the deciduous teeth, and while perhaps not directly the cause there is no question in my mind but that the sympathetic nerve irritations predispose to dysentery as well as diarrhetic disturbances of the alimentary canal, while the more frequent causes of dysentery are undoubtedly improper feeding and impure water. Next to this, and it might seem almost leading it in special localities, miasmatic influences have their causal relation, while seasonal changes are not to be overlooked.

Acute Catarrhal Dysentery.—The acute catarrhal variety of dysentery that is seen most frequently in temperate climates occurs either sporadically or endemically. Its lesions are confined to the colon and rectum, especially the former, the mucous membrane of which is swollen and enlarged, intensely hyperemic, showing slight punctiform hemorrhagic spots. The ilium may be also involved. The mucous membrane of the colon varies in color from bright red to dark purple; its most striking feature is the en-

largement of the solitary follicles, which stand out prominently from the mucous membrane. In other acute forms occurring in children it is very like acute follicular inflammation of the colon. (Osler.) The solitary lymph follicles are swollen, and between the inflamed areas the mucous membrane is simply hyperemic or altogether normal in appearance. In some cases the punctured spots break down and ulcers form. Their edges are everted and flattened, and they may be regular in shape or serpentine. Where a fatal issue ensues it is almost invariably due to perforation at the site of one or more of these ulcers, all of the intestinal coats being destroyed in the process. General peritonitis follows upon perforation, the case terminating very abruptly.

In tuberculous children the mesenteric glands will often be enlarged. Various complications may ensue, resulting in pathological lesions of the brain and lungs, but, fortunately, these are not very apt to occur in children. Microscopic examination of a dysenteric colon reveals destruction of the surface epithelium of the lining of the intestinal tubules; the glandular tissue is infiltrated, the mucous membrane softened, and necrosis is extended well down into its structure. Pus-cells and epithelial debris are seen in the glands and their ducts and in the open ulcers, which are shallow and not sharply defined. The intestinal follicles are swollen and transparent, opaque or gray in color. In some instances the sloughs have separated and the entire colon presents patches of ulceration, while in others the follicles alone suppurate, or are partially necrosed.

DIAGNOSIS.—Except when occurring epidemically dysentery is not always recognized early in its course. It will usually have been preceded by acute intestinal catarrh, and not until the dysenteric stools show themselves is the condition made clear. In most cases of catarrhal dysentery in infants or young children there will be profound dyspeptic symptoms, nausea, vomiting, loathing of food and bilenteric diarrhea, generally present from twenty-four to forty-eight hours before the characteristic stools are seen. During this time there are acute abdominal symptoms, as colicky pain and distension. The dysenteric character is not clearly proclaimed until stools contain bloody mucus, and perhaps pus, alone or with mucus or fecal matter, almost or entirely odorless or having the odor of fresh meat, and accompanied by tenesmus and blood streakings, in severe cases by almost clear blood. In other instances there will be no difficulty in making a diagnosis from the start, as from sudden changes in the weather or acute dysenteric inflammation when the case will manifest at once by shiverings, aching of the limbs and back, sharp fever and the expulsion of bloody, mucus stools.

SYMPTOMS AND COURSE.—As already suggested, most cases are preceded by premonitory dyspepsia and diarrhetic symptoms.

These may last but a day or two or three before dysenteric symptoms develop. Usually, however, within about thirty-six hours from the first symptoms of illness abdominal pains of a colicky character occur, with frequent stools, passed with straining and tenesmus, and having shreds of mucus and slight streakings of blood. If ushered in by a chill acute fever quickly follows, and mucus with pain, griping and tenesmus are present. The tongue is moist and covered with a whitish fur. The pulse is rapid and compressible, and debility soon presents as a feature in these cases. The abdominal tenderness is not likely to be general, but is limited to the ilio-cæcal region, or more often to the transverse colon, especially near the splenic flexure. The temperature may run as high as one hundred and two or one hundred and four, and in children nausea and vomiting are likely to be present, although in many instances it is not seen at all. At first the stools are partially composed of fecal matter, but soon these disappear and they become smaller, more frequent, odorless, consisting of mucus or blood and mucus, and perhaps pus. Occasionally there will be seen slight scrapings or shreds of mucous membrane and sloughs of considerable size from the colon. The proof of membranous destruction is generally evidenced in the evacuations, consisting of the detached particles, which may present as shreds and scrapings in the watery discharges or discharges of blood and mucus. As the case progresses the mucous membrane becomes more swollen, the desire for stool becomes more frequent, with intermissions of from one to three hours at best, and often of but a few minutes, the patient desiring to remain at stool continually. The never-get-done feeling of *Mercaria solubilis* is present in most cases within twenty-four or thirty-six hours after the commencement of the attack. In many children as many as thirty or forty or fifty stools, or more, occur in twenty-four hours. The straining is sometimes distressing, and the efforts of the child to expel the stool, or that which it thinks to be stool—really the swollen mucous membrane of the intestine—are frightful. Children who are too young to be controlled in this matter will strain until their blood vessels are distended, muscles rigid, face flushed, and the bowel protruded *æ* half an inch or more, so desperate are the efforts to void the contents of the bowel and this swollen membrane.

From the mixed stool of the first twenty-four hours, which usually consists of more or less clear mucus with small portions of feces and a small quantity of blood and mucus, the stools become gelatinous, bloody and thin, almost opaque with pus and debris, and later assume a grayish color, finally becoming brown; as the case approaches recovery they are partially mixed with fecal matter, and of fecal consistency and odor. In cases especially severe the abdomen may become very much distended and painful. The

pulse is thready and intermittent. The child lies partially comatose, with its lids partly closed and pupils widely dilated; or it may become very restless, manifesting intense suffering and distress; cerebral symptoms, even to wild delirium, and convulsions characterize its course and result fatally.

Prognosis.—Catarrhal dysentery occurring sporadically usually ends in recovery, the duration of the disease being from four to five days to a week or longer, depending upon dietetic, hygienic and medicinal treatments. If individual cases occur from acute systemic infection from poisoned water, or from exceedingly active cause, convulsions may supervene or perforation of the bowels may result from violently acute involvement, with quick destruction of the intestinal coats, and death result in two or three days. Unfavorable symptoms are unusual frequency of stool, severe loss of blood, high grades of fever, cerebral disturbances, expression of collapse and hiccoughs—especially dangerous, because of being evidence of cerebral effusion from metastatic involvement.

Epidemic dysentery of the catarrhal variety is not attended by a high mortality rate ordinarily, although in unusually unfavorable seasons in intensely miasmatic districts it may result in considerable destruction of life. More often the affection becomes chronic, lasting over a period of several weeks and even months, and especially is this likely to be the case if it comes on in the summer or early in the fall in Southern countries. Winter dysentery is subject to recurrences until hot weather supervenes, just as summer dysentery is apt to drag along with occasional relapses until winter sets in.

Amebic Dysentery.—As has been stated in connection with the etiology of dysentery it is due in some sections of the country, especially in the tropics and malarious districts of the South and Southwest, to a specific micro-organism already described. It is this type of dysentery that prevails on the African coast, at Panama, and other Southern countries, and while rarely seen in the United States outside of the Gulf region it is known along bayous and sluggish streams draining the flat countries of Texas, Louisiana, Mississippi and other Southern states. The author has witnessed severe epidemics of this form of dysentery as far inland as three hundred miles from the Gulf of Mexico, in the malarious section of Eastern Texas. It presents about the same characteristics as catarrhal dysentery, except that it is much more intense; the stools are rarely if ever accompanied by diarrhetic features; metastases are much more characteristic of its course, and its mortality is greatly increased over the catarrhal variety. Its pathological lesions are often ulcerations in the large intestine, as infiltration and necrotic spots on the mucous membrane, which throw off considerable-sized sloughs, these appearing in the stools. The indi-

visual ulcers are often of irregular shape and undermine the mucous coat, the pus burrowing for some distance below the ulcer, connecting with bridges of half-destroyed membrane between. The ulcerations are much more apt to be seen about the hepatic, splenic and sigmoid flexures, and tenderness and pain are more apt to be expressed at these sites. If both flexures and the entire transverse colon are the site of hyperemia and ulcerations the pain will extend clear across the abdomen and cause the patient an inconsiderable amount of suffering. The inflammation and ulceration of this variety of dysentery are not apt to be purulent. Examination of the stools will show large quantities of amebæ in the intestinal structure; these are found especially in the tissues immediately surrounding the ulcers at their base. They are occasionally found in the blood vessels, and it is perhaps from emigration through the circulation to the liver that abscesses of that gland result. I have operated upon patients having abscesses of the liver from this cause in which the entire structure was studded with minute amebic abscesses, and in two instances have removed enormous quantities of pus—in one more than a quart, and in another, recorded in the *Southern Homœopathic Pellet* for November, 1884, more than a gallon of pus was removed, the case resulting fatally on the eighteenth day after operation. Occasionally large single abscesses attend upon amebic dysentery, but usually they are multiple and located immediately under the capsule. It not infrequently happens that adhesions form between the liver and diaphragm, the inflammatory process extending to the capsule, diaphragm and pleura, the abscess bursting into the pleura and discharging enormous quantities of pus through the lung and by the mouth. Metastatic abscesses in the lung may arise from this cause in individual cases, though they doubtless arise altogether independently of liver involvement as well. Occasionally abscesses are walled in and their liquid elements absorbed, the patient recovering in spite of their presence. As may be imagined these pathological conditions are very much more likely to occur in adult life, but occasionally occur in childhood; epidemics of amebic dysentery being by no means limited to adults and youths. I have witnessed them in young children, and in tropical countries this form of the disease is the cause of large mortality below the tenth year of life. Abscesses of the liver and lung may also occur in children. I have personally known of two such instances in negro children.

SYMPTOMS AND COURSE.—Tropical dysentery is by no means confined to tropical countries, though more common in them. It is ushered in about as is the catarrhal variety of dysentery. The initial symptoms are often diarrhetic; or the very first indication of illness after a brief period of lassitude, and perhaps moderate discomfort about the bowels, may be a mucous discharge. In these

cases there will be headache, chilliness, abdominal pain and tenesmus. Nausea and vomiting are not always present, though they show more constantly in children than in adults. When passively dysenteric stools are seen from the beginning they may be one of two varieties, largely composed of grayish mucus and intestinal debris, known by the common name of "gray dysentery" in the South, or composed of a clearer mucus mixed with blood, perhaps the blood predominating, this form bearing the domestic name of bloody flux. The stools become frequent, sometimes as often as every half hour or hour; youths and children old enough to be restrained may not go to stool oftener than every three or four or six hours, but with younger subjects the desire is almost constant, and in infants the diapers have to be changed frequently. In quantity the stools may vary from a teaspoonful to a tablespoonful or even to two or three tablespoonfuls of mucus and blood. In the mucoid variety it is greenish or green and gray, with occasional intermingling of liquid fecal matter. In the bloody variety there is often more blood than mucus, in some instances the blood amounting to an oozing, or rather active hemorrhage; abdominal pain and tenderness are not always present, but straining and tenesmus may be said to be constant, being only occasionally absent. In violent cases the pain is severe, the onset sudden, the fever more pronounced, and in children who are compelled to strain a great deal cerebral symptoms are early present. In domestic practice convulsions are often excited by opiates and astringent remedies which suppress the disease. With the straining will be seen rectal prolapse, a sore, irritated, bleeding outfolding of the lower inch. Often, even in young children, considerable hemorrhoidal enlargement will be witnessed and not infrequently superficial ulceration of the mucous membrane will be seen.

The course of amebic dysentery is either very acute, as in its most active manifestations, with violent onset, severe pain, high fever, quick ensuing of bloody mucous discharges, active hemorrhage and extensive ulceration, or it will be protracted in the less acute case, its course lasting over several weeks, even months. An aggravating alternation of improvement and relapse frequently occurs, recovery being delayed until the patient is anemic and muscularly debilitated. I have seen cases occurring in the Southern malarious districts to last over many months in spite of the very best efforts that could be exercised toward their cure.

Although the suffering is more pronounced and its pathology more defined, especially in its complications, than catarrhal dysentery this variety is not very fatal in this country. Complicated by pernicious intermittent fever, or presenting as a dysenteric variety of that disease, it may be rapidly fatal. In occasional instances the area of destruction of mucous membrane and submucous tissue, especially the latter, is so great that local gangrene occurs,

resulting in peritonitis and death. Abscesses of the liver are responsible for a great deal of the mortality of amebic dysentery, and in young children, whose cases partake of unusual violence, convulsions complicate and frequently terminate the case. The general tendency of the disease, however, is toward chronicity, it being many weeks or months from its initial manifestations until the patient is wholly recovered.

Diphtheritic Dysentery.—The most fatal variety of dysenteric inflammation is that coming under the name of cronous inflammation, or the diphtheritic variety of acute intestinal ulceration. It is a form of colitis in which death of considerable areas of mucous membrane occurs, large-sized sloughs being thrown off, leaving open ulcers. In a fair proportion of cases the process is not limited to the colon but involves the ileum as well, and takes on the name of diphtheritic entero-colitis or diphtheritic dysentery. This special form of diphtheritic inflammation occurs as a primary disease and also as a sequel to various acute organic diseases. It is perhaps more frequently seen in connection with pneumonia than any other acute ailment; and when dysentery is present as a complication of diphtheria it is because the disease-process has extended to the mucous lining of the intestinal canal. It is seen also in connection with certain chronic diseases, especially Bright's disease, chronic valvular lesions of the heart, and in cachectic states generally. The pathological condition in this form of dysentery is the presence of patches studded over the entire colon and lower portion of the ileum. The colon is enormously enlarged, its tissues thickened and its mucous membrane covered with patches of pseudo-membrane or yellowish exudate. The necrosis of the membranous coat is extensive. When superficial only the upper layers of the membrane are involved, but if the entire mucous tissue is diseased it is friable and necrosed over considerable areas. Large sloughs and casts are thrown off, as if the bowel had shed its mucous membrane; these are more extensive in the region of the cecum. The rugæ are entirely obliterated by the degree of infiltration, which is sometimes as great as one-fourth to one-half an inch in thickness. In many cases the membrane appears to be studded here and there over its surface with areas of interlying mucous membrane, congested and infiltrated, but not yet ulcerated. In severer cases the membrane is involved contiguously over large areas of surface. The pseudo-membrane is composed of necrotic cells, and sometimes blood and pus corpuscles, and is very like the pseudo-membrane of diphtheria in the throat.

In the chronic form of the disease attending upon Bright's disease or chronic heart lesions the membrane is not so dense, nor the lesions so extensive. A mucous film appears as a fine superficial exudate upon the epithelial layer of the mucous membrane, scat-

tered patches being seen on the ridges and folds of the colon. If there shall have been a lighting up of an acute form of the chronic disease, this serving as a basis for the appearance of dysentery, the case will be more immoderate and the membrane correspondingly firm and extensive, the degree of necrosis being correspondingly great. Following upon pneumonia the exudate seems to lie upon the mucous membrane rather than imbedded in its structure, as in the idiopathic variety of the disease, and has not the form that attends upon chronic Bright's disease and other cachectic diseases.

SYMPTOMS AND COURSE.—Coming on as a primary affection diphtheritic dysentery is ushered in by a much more violent onset than the acute catarrhal form or the amebic variety. Furthermore, it is never witnessed in very young children, belonging more to adults, though occasionally seen in children from five and six years up. Occurring as an attendant upon diphtheria of the throat and nares it is seen at any age. In adults it is more common among debauchees, and in child life is more frequently seen among children possessed of constitutional dyscrasie and living in foul quarters upon unwholesome food, with general ill-nourishment. It is ushered in with a chill, followed quickly by high fever, great prostration, severe abdominal pain, and frequently repeated mucoid and bloody discharges. The abdomen is distended and very sensitive to the touch. The discharges are sometimes diarrheal in character at first, though blood and mucus may be present from the start. These are not so constantly seen as in the follicular variety, the outpouring of serum from the follicles being resolved into the exudate instead of being thrown off by the intestine. If the case is ushered in violently the fever may range as high as one hundred and five to one hundred and six degrees, intense heat and delirium occurring early. If sloughs are thrown off the case is less severe than where the exudate is so firm as not to be loosened. Here the infiltration of the deeper structure of the bowels is greater and fatal necrosis is more apt to supervene. If the case takes on a severely dangerous state the pulse becomes weaker and more rapid, the tongue dry and leathery, the features pinched and sunken, the abdomen more or less distended and the patient quickly goes into drowsiness, finally becomes comatose and dies in an asthenic state. In occasional cases the low typhoid condition supervenes, the issue dragging along for several weeks, as in typhoid fever, from which this type of diphtheritic dysentery is differentiated by the absence of typhoid petechiæ and the characteristic temperature range, the absence of the pea-soup diarrhœa, and by the character of the discharges of the bowels.

Chronic Dysentery.—All the varieties of dysentery that have been described pass into the subacute and eventually chronic form of the disease if not promptly cured or attended by early fatality. The amebic variety, especially, is very prone to chronicity, and, as

suggested in treating of that variety, it is sometimes so gradual and insidious in its approach as to justify the suggestion that it is subacute or chronic from its inception. The catarrhal variety is much more likely to come on suddenly and show a moderate and well defined acute course, and the dysenteric type also presents acuteness of course, being less likely to become chronic than any of the others, because unless promptly relieved it is much more apt to result fatally.

The passing of either variety from acute to chronic stages, except as suggested in connection with anemic dysentery, is a gradual process. Under efforts at treatment during the acute stage improvement sets in and the patient is supposed to be cured, though never quite well, and after a few days or weeks or so there will be a return of dysenteric discharges and a lighting up of the old symptoms. Under treatment or change of diet or both improvement again sets in, and so it goes, extending over a considerable period of time, until it is eventually appreciated that the case has become seated and chronic in form. The pathological condition in this form is usually that of a swollen, puckered, roughened mucous membrane throughout almost the entire extent of the colon, the submucosa being thickened and infiltrated and the muscular infiltration also being considerable. Local ulcers are present in places and the swelling of the submucous and mucous structures results in considerable reduction in the calibre of the bowel. If ulceration has been extensive in the acute variety strictures may occur here and there with permanent impairment of the intestinal canal.

SYMPTOMS AND COURSE.—Chronic dysentery presents a very ill-defined course. It is so often intermixed with chronic diarrhea that a diarrhetic state of the small intestine is likely to prevail when a chronic state of the colon is present, and the two diseases are usually seen in combination. It may be that the digestive abilities of the small intestine are not interfered with, and that there is present a combination of healthy stools covered by or mixed with clear mucus and blood from the dysenteric regions of the colon. With subsidence of the acute manifestations of dysentery the tenesmus and pain generally cease and are not present during the chronic course of the disease except as abdominal tenderness. Local sites of soreness may remain, but the general tenderness and abdominal distension will have disappeared. It not infrequently happens that the combination of firm, constipated stools and blood and mucus are seen in these cases. In frequency the discharges vary; sometimes they occur as often as every hour or two, in other cases being limited to three or four per day. The appetite is usually capricious, sometimes abnormal. If the patient can be kept on easily digested diet, without great variety of food, his recovery is more prompt and certain. More than once have I witnessed what was supposed to be recovery of the sick child from

chronic dysentery, only to have an aggravating relapse, a discharge of bloody mucus following immediately upon a slight variation from sick-room diet, faithfully persisted in until all danger of relapse was thought to have been passed. Children who are sufferers from chronic dysentery are quite apt to be anemic and debilitated. They are fretful and peevish and sometimes from debility considerable edema of the extremities results. Their sleep is restless and disturbed and stomach pain and other evidences of intestinal dyspepsia, as eruptions of gas, offensive flatus, and more or less variability of appetite, either anorexia or morbidness, are present. The complications and sequelae are about as described in connection with the acute varieties. It is not often, in fact, that sequelae occur in connection with dysentery in child-life. They are more likely to attend upon the amebic variety than the catarrhal or diphtheritic. Suppressions of chronic dysenteric discharges by opiates and astringents may result in the oncoming of severe pain in the bowels, delirium and a fatal issue, but if treated constitutionally and by proper diet the chief annoyance following upon the acute manifestations of dysenteric inflammation is the passing of the case into the chronicity just described.

Treatment.—The general treatment of dysentery involves consideration of diet, general hygiene of the patient, proper nursing and correct medication. It has long been the habit of the old school profession to commence the treatment of dysentery with purgation, with the hope of getting rid of the offending causes, whether they be articles of food, decomposed mucus, accumulation of intestinal debris, or intestinal parasites, formerly held to be among the chief causes of dysenteric inflammation. Even yet a laxative dose of oil or a more vigorous purge is administered with the idea of clearing the bowel preparatory to the commencement of medicinal treatment. This procedure has been proven highly objectionable. The extent of surface of the mucous membrane involved in the inflammatory process precludes the possibility of purgative removal of irritating particles of fecal matter, or poorly digested food, without doing injury to extensive areas of inflamed tissue. Hence the routine practice of laxation in domestic treatment by the old school and by pseudo-homoeopaths is not justifiable. It is reasonable to administer a mild laxative if the history of the case gives positive evidence of the presence of irritating substances in the intestinal canal. If acute diarrhea or acute dysentery set in immediately after gross violations of dietetic hygiene a brisk laxative may possibly help in cutting short the case. The soot may have to be beaten out of the stove pipe. As a rule, however, nature is quite able to take care of herself in this regard, and the very outpouring of liquids from the intestinal surfaces, showing as diarrhea, is almost certain to remove foreign substances from the intestinal canal. Hence the use of laxatives

is not only unnecessary but generally harmful. If in the judgment of the physician it is necessary to clear the bowels by this means the simpler the agent the better, pure glycerine being given preference. Little objection will be offered to the use of a moderate dose of castor oil administered alone if it be certain that irritating particles or scyballe are yet within the intestine. Saline purgatives and medicinal liquids are never justifiable.

Diet.—The diet in dysentery is of greatest importance. In acute cases the diet will have to be restricted to liquid foods almost exclusively. With children pasteurized milk must form its basis. Raw milk is not permissible at all, and the domestic habit of attempting to check the frequency of the action by boiled milk is equally pernicious. Its curd is very much condensed and rendered correspondingly indigestible, the mechanical irritation of the intestinal tract being greatly increased thereby. Milk brought to a scald and seasoned with nutmeg, cinnamon and other astringent condiments has been extensively used in mild cases of dysentery, but the homoeopathician will object to the spices in this connection, and, in fact, they are not necessary. Hot milk, barley broth, peptonized beef with milk, and sometimes whipped egg and milk, are excellent articles of diet in young children suffering from dysentery. In older children rice-paste, either cooked plain or first parched and then boiled, is permissible, and as improvement sets in the pulp of tender beef is allowable. Occasionally buttermilk will be very grateful and refreshing. If used it is best to strain it through two thicknesses of cheese-cloth in order to detach the butter in so far as possible. If young children tire of milk "coffee-water," made by soaking pieces of well-done toast in sterilized water, will be grateful. A child suffering from any form of gastro-enteric disease should be given no water that has not been previously boiled and securely stoppered before cooling.

Chicken-broth is tabooed altogether. Broths from the lean meat of chicken and from crushed chicken bones are alike objectionable. In a recent article on diphtheria appearing in the *Medical Century* Prof. R. N. Foster of Chicago, than whom there is no better clinician, eschewed fowl altogether, from the tenderest parts of the young chicken to the full-grown, thoroughly-matured fowl. I agree with him fully, and have long since discarded fowl of all kinds from the sick-room. Clam-broth is an excellent article of diet for sick children, even though looseness of the bowels be present. Broth made from peptonoids, wherein the meat has already undergone albuminoid digestion, and been thereby rendered capable of ready absorption by the stomach, is one of the best articles of diet for the sick-room, and is especially suited to the feeling of dysenteric children. There is little residue from it to reach the colon.

Various mucilaginous drinks are grateful. Jelly water made from fruit jells that are not too sour; gum-arabic water flavored to taste, and flax-seed tea not too thick, flavored with a little orange juice, are among the best of these drinks.

AGUAVANTS—Local applications of hot cloths, of either wet or dry heat, preferably the former, are grateful to the little patient suffering from dysentery. Two or three thicknesses of flannel cloth heated as hot as can be borne and applied directly will usually be comforting. In the country I have found it possible to continue the application of dry heat to the abdomen for a considerable length of time by applying an ordinary tin plate as hot as can be borne over a thickness of flannel. In this way the heat is retained much longer than by cloth alone and the degree of comfort is greater. Heavier substances, although retaining heat longer, are too weighty. Bags of heated hops or hot bran are much relied upon in domestic practice, and sometimes serve an excellent purpose. The local application of hot medicinals, as *Calendula*, *Hæmamelis* and alcohol, and in domestic practice petroleum, turpentine, or some favorite liniment, is very much resorted to, with varying success. The homeopathicity of turpentine to intestinal inflammation doubtless explains much of the success that attends its use in domestic practice. In a general way I have not found that topical applications are very helpful in the treatment of dysentery, but in special instance they are very comforting, particularly when there is a good deal of distension of the colon and the tenderness and inflammation are pronounced. Nor do I believe they interfere with properly indicated homeopathic remedies. The combined local and internal applications of *Terebinthina* are often very successful in relieving the acute suffering of catarrhal dysentery. *Opium*, in the form of laudanum, over the abdomen or internally, in any of the forms of dysentery is highly objectionable. I have seen more than one case of opium poisoning by absorption of the remedy applied externally in the form of laudanum, and am sure that its indiscriminate use is frequently attended by suppression of the disease and metastases to other organs. I have never met with a case of abscess of the liver as a complication of dysentery in which opium had not been early administered for the purpose of checking the latter disease.

The application of remedies per rectum, as injections of starch or flax-seed emulsion, are often found to be soothing. Likewise the copious use of warm water injections is generally grateful. These should be practiced systematically. The infant or young child suffering with dysentery should be placed upon its left side, with its hips slightly elevated, and from a pint and a half to two and a half pints of warm water, which has been previously boiled, should be allowed to gravitate into the bowels from a fountain syringe, flowing gently—not admitting the water in jets, as this

causes pain—until the large bowel shall have been completely flushed. By this process all particles of fecal matter and partly digested food, as well as clots of bloody mucus and epithelial debris, are washed away. This alone affords considerable relief. Besides, the application of heat, the water being about as warm as can be comfortably borne, is soothing to the inflamed membrane, and, furthermore, some absorption takes place, in part compensating for systemic waste. The water should be allowed to flow until it appears perfectly clear, and the douches should be repeated as often as the exigencies of the case demand, two or three times a day, or every three or four hours if necessary. If considerable hemorrhage is occurring the douching may be of water as hot as can be borne, and it may be well to add *Hæmamelis* to it. Calendulated water may be used if there is a good deal of ulceration and evidence of rectal irritation. The practice of administering opium in rectal injections with infants is not only unscientific because inecacrate but is also dangerous. If the drug is to be administered at all it should be given per os or hypodermically. But relief is more certain to be obtained by other lines of treatment not attended by like danger of suppression and metastatic abscesses.

MEDICATION.—The remedies that will be often called for are few in number, while almost any remedy in the materia medica may be occasionally demanded in the chronic forms.

Aconite.—Beginning, as with most acute diseases, it is useful in the autumn when the days are warm and the nights cold. The stools are frequent and scanty, small, brown and painful; the case is ushered in with a sharp chill, quickly followed by hot, dry skin and the general *Aconite* picture.

Ferrum phosphoricum is more often needed than *Aconite*. The fever is not so intense as that of *Aconite*, hence this remedy corresponds more to the fever of dysentery as generally seen. The stools are of pure blood, or blood mixed with mucus and bloody water. They are painless, and the dysentery is the result of sudden checking of perspiration in hot weather.

Belladonna is suited to the congestive type, coming on suddenly, with hot, dry skin, flushed face, intense headache, tongue dry and hot, and tenesmus exceedingly severe. The child strains and strains as though it would void the entire bowel. Dysentery attended by cerebral symptoms with dilated pupils, besotted countenance and delirium.

Cantharis has stools which look like scrapings from the intestine or like washings from raw beef. Cutting and burning in the anus, and vesical tenesmus. Child cannot urinate, is in pain and cries in consequence. Bladder distended; urinary sufferings increased from efforts at straining at stool.

Mercurius corrosivus has severe tenesmus with scant stools and bloody mucus, the blood predominating, the mucus being clear

and viscid like the raw white of egg. It also has tenesmus of the bladder and burning of the anus, the difference in the character of the stools differentiating it from *Cantharis*. These two remedies have tenesmus more marked than any others.

Mercurius solubilis has less acute tenesmus than *Mercurius corrosivus* but its characteristic is the "never-get-done" feeling, the desire to remain long at stool and to continue straining. Straining is not more acute than with other remedies but is more continuous. "Gray dysentery" of the amebic variety. Considerable-sized stools of gray mucus, or grayish mucus mixed with epithelial debris and some fecal matter. The *corrosivus* has clear mucus, while the *solubilis* has the gray flux character of stool.

Kali bichromicum has blackish-watery or bloody stools, or jelly-like stringy discharges. The tongue is dry and red at the edges, and is smooth and cracked. To this character of tongue and jelly-like stools, or stools of burning, frothy water, *Kali bichromicum* is best suited.

Ipecac is adapted to dysentery occurring in the autumn season with severe pain and tenesmus before, during and after stool, attended by much nausea and persistent vomiting.

Nux vomica is especially applicable to the dysentery of debauches, or people addicted to the excessive use of spices, highly-seasoned food, strong coffee or tobacco. The tenesmus ceases as soon as the stool passes.

Pulsatilla is applicable to the ever changing dysenteric stool of children. No two stools are alike. Dysenteric stools that are clear yellow, reddish or greenish; slimy discharge of blood and mucus with lenty. Frequent passage of mucous stools occurs during convalescence from dysentery, or after the patient has been supposed well.

Colocynthis corrects dysenteric diarrhea, worse immediately after taking food or drink. Intense straining, ceasing for a time after stool but soon commencing again.

Arsenicum is especially adapted to dysentery with small, foal ulcers, great prostration, intestinal sloughs, and hectic symptoms occurring in connection with the amebic or diphtheritic varieties.

Baptisia, *China* and *Arsenicum* are to be especially thought of in dysentery occurring during the prevalence of typhoid or malarial fevers. In *Baptisia* the prostration and typhoidal symptoms are pronounced even though the dysenteric discharge be not very frequent. The tongue is dry and brown, the system depressed.

China is especially useful for the dysentery of marshy districts with an intermingling of malarial symptoms; dysentery occurring on the alternate day or with regularity.

Carbo vegetabilis, *Lachesis*, *Secale* and *Nitric acid* are especially suited to hemorrhagic types of dysentery. *Hamamelis* is also

applicable here, both internally and locally over the abdomen or by enemata.

Bryonia, *Colchicum* and *Dulcamara* are to be thought of in connection with aggravations from seasonal changes, occurring during the fall season of the year with much damp weather or sudden change from hot days to cold nights.

Magnesia phosphorica, *Colocynthis*, *Chamomilla*, *Ipecac* and *Belladonna* are especially to be considered in connection with abdominal pains of dysentery. *Nuxvomica* is also suited to this state and it will rarely be necessary to rely upon opiates or other pain-reliefs if care is exercised in the selection of the proper simillimum.

Iris versicolor, *Mercurius solubilis*, *Leptandra* and *Podophyllum* are especially applicable to the so-called bilious dysenteries occurring during the summer season and early fall. Dysentery with bilious vomiting, heavily coated tongue, foul breath and general bilious symptoms may need any one of these remedies, according to its own special indications, more particularly in adults and youths than in young children. *Iris* and *Podophyllum* are especially adapted to the gastro-hepatic conditions attendant upon dysentery in miasmatic sections.

In chronic dysentery *Sulphur*, *Psoraleum*, *Sepia*, *Lycopodium*, *Zincum*, *Calcarea*, *Arsenicum* and *China* are especially deserving of study.

CHAPTER LIV.

INFLAMMATION OF THE CECUM AND APPENDIX.

General Considerations—Symptoms and Course—Diagnosis—Treatment.

General Considerations.—There are certain inflammatory diseases which have their local site in the region of the ilio-cecal valve and in the right ilio-lumbar region which have to be differentiated from the pathological process of typhoid fever, and from symptoms of dysentery belonging to the lower portion of the ascending colon and the cecum. They are not confined to childhood but by no means are children exempt from them. In the earlier years of my experience I had occasion to treat children for typhoid states who were sufferers from typhilitis or cecitis, as the parenchymatous inflammation of the caecal colon is termed, or from peri-typhilitis. In many instances the physical symptoms are so nearly like those of typhoid states that it is often quite difficult to differentiate between them, hence the necessity for careful consideration of this disease.

Besides typhilitis and peri-typhilitis we have appendicitis, which has become one of the favorite diseases among adults at the present day. It consists of an inflammation of the appendix vermiformis. Diseases of the latter and abscesses from it in its immediate neighborhood are much more common than inflammation of the cecum itself.

It is hardly necessary to go into extensive discussion of the differential symptoms, course and management of typhilitis, peri-typhilitic abscesses and appendicitis. Clinically they arise from the same causes, the appendix usually being first involved. Their symptoms and the conditions from them are very much alike, in fact one is very rarely present separately. Appendicitis is more often followed by abscesses than is cecitis, and cecitis is, in turn, almost invariably associated with appendicitis; so that for clinical purposes it is sufficient to describe inflammation occurring in the ceco-appendical region in a general way, with especial reference to its differentiation from enteric fever.

Without assignable reason these affections are more common to male children than female. They are also given to early life, and are seen more frequently in tuberculous children. Especially is this true of abscess formations in this as in other regions. Habitual constipation is an operating cause in many cases, as is also the lodgment in the appendix of grape seeds and seeds from other fruits. Undigested particles of food sometimes set up cecitis, or even make their way down into the appendix and light up appendicitis. The practice of using drastic purgatives is a common cause. In children predisposed to glandular and inflammatory troubles a simple cold may serve as an exciting cause, if there be present constipation with local irritation of the cecum in even moderate severity. Injuries, as kicks, blows, or other injuries to the abdomen, if directed to this immediate locality, set up inflammation with peri-typhilitic abscess as a result, in which instance the peri-typhilitic tissues will be primarily involved. More rarely inflammation of the cecum and appendix attends upon amebic or diptheritic dysentery. I have never met a case in connection with typhoid fever, but can readily understand how by extension of the inflammation the cecum may become involved and peri-typhilitic abscess follow.

Symptoms and Course.—As with most inflammatory conditions of the abdomen inflammation in this neighborhood is usually ushered in by a chill, accompanied by acute pain in the right iliac fossa. The chill is quickly followed by fever, with a sense of fullness and distension in the affected area. In individual cases the pain is intense, of sharp, lancinating character, somewhat relieved by pressure, by bending double and by applications of heat. Colic is manifested by pains in the region of the navel; though the attention of the physician is not always directed to the

ilio-cecal neighborhood inspection will usually reveal slight swelling in the fossa within a few hours, and palpation will locate the tenderness in this region, even though the colic symptoms are complained of in the region of the umbilicus. "McBurney's Point" is indicated by a point extending an inch or one and a half inches from the anterior-superior spine of the ilium and a line drawn from that point to the umbilicus. In young children this will be located perhaps only an inch to the left of the right spinous process and corresponds to the location of the appendix. If general inflammatory disease be present the area of pain and tenderness is too great for it to be easily localized, but as a rule this clinical "point" will be plainly marked as the site of pain. After a few hours or a day or two of acute pain there will be considerable fullness of the intestine in this locality, and upon palpation the thones will often be felt to be somewhat tumefied. Deep pressure will reveal crepitus, felt less in the ilium than with enteric fever. If the case be very acute, as is usual with children, vomiting is among the most common symptoms and the most distressing, consisting at first of simple vomiting of the contents of the stomach, but this persisting and followed by the ejection of gastric juice and bile. In rare cases if peri-typhilitis and intussusception have occurred together fecal matter may be vomited. Constipation is more usual than diarrhea, and, in fact, is one of the most common causes of the condition under consideration. When the acute inflammatory process is fairly on the bowels will generally be torpid, rarely moving of their own accord. Evacuations may be had by copious colon flushing. The use of purgatives or even laxatives is not permissible when cecal inflammation is present.

Not always are these cases ushered in by the acuteness just described. There are ambulatory types of this as of many other diseases. A child will suffer slight colicky symptoms, pain in the ilio-cecal region, considerable tenderness and tumefaction, recurring chilliness, a well-marked case of catarrhal appendicitis, without giving up and going to bed. These masked cases are less pronounced than the fulminating variety, and are quite apt to be looked upon as recurring attacks of malarial manifestations or as a catarrhal condition of the child's intestines. The fever is not very intense, the tongue is somewhat furred, the child is languid, has headache and some debility, and in these ambulatory cases presents more of the picture of a case of walking typhoid than in the fulminating type; though the symptoms may not be intensely acute the pain is often very sharp. In this variety the child is more generally ill and because of the abdominal pain and early distension in the cecal region will lie in the dorsal decubitus with its knees drawn up in order to secure relaxation of the abdominal muscles. The fever is more apt to be of the hectic type

than continuous, but the teeth and tongue may be covered with *sordes* and the case take on the general typhoid appearance in those doing badly.

The inflammatory stage may last from a few days to two or three weeks, depending upon its acuteness and the area of involvement. If inflammation extends over considerable mucous surface in the cecum, and spreads to the appendix and surrounding tissues, the case may drag along for two or three weeks, presenting much the course of mild typhoid, with which it is most often confounded. If it be more intense, even though the area of inflammation be much less, destruction may occur within a few days, perforation resulting and general peritonitis destroying life within a week. Suppuration in the tissues surrounding the appendix and cecum follows upon perforation of the appendix and in some cases occurs without perforation, the symptoms being those of suppuration elsewhere; the pain, tumefaction and tenderness are usually increased, and pronounced hectic symptoms which accompany pus-formations are noticed. The skin looks white and tense over the tumefied area, or dark and congested, depending somewhat upon the degree of distension. If the abscess is near the surface fluctuation will be observed, and unless the abscess be opened and cleansed pus may burrow under Poupart's ligament, even down on the inner surface of the thigh, as does psoas abscess. More often it is walled off from the peritoneum by adhesive inflammation and thus peritonitis is avoided.

Diagnosis.—The differentiation between appendicitis and enteric fever is not always easy, and yet careful analysis of the two diseases will separate them very satisfactorily. Enteric has its petechiæ, diarrhœa, hemorrhages, regular gradation of temperature and its more continuous course. Furthermore, the area of tenderness is generally greater, the pain and crepitus being somewhat to the left and above that of appendicitis. Constipation is more often the condition in cecitis, and with the exception of the umbilical pain that occurs in some cases early in the course of the disease the pain is localized to the McBurney point and immediate vicinity. It is diagnosed from intussusception by the fact that the pain of the latter is generally anywhere in the abdominal region, though usually about the umbilicus, and instead of the elevation of temperature it is usually normal, or even below normal. There is not only constipation, which is absolute in these cases, but no passage of gas occurs even, whereas in appendicitis there is usually much gas and an occasional action of the bowels from the use of euemata. The tumefaction of appendicitis is always in the right iliac fossa, while the distension of intussusception appears much more like a tumor and is located anywhere in the abdominal cavity, more commonly in the median line or on the left side. From psoas abscesses, iliac abscesses on the right side, or hip-joint

disease there ought not to be very much difficulty of differentiation. Peri-nephritic abscess, and abscess of the abdominal wall have been mistaken for appendicitis, but the exercise of judgment here will usually show the attack of inflammation to be in the cecal or appendiceal region, with sufficient certainty to render diagnosis absolute in a large majority of cases.

Prognosis.—This in children is usually favorable. Death occurs only from general peritonitis following upon perforation or from protracted septicemia. In careful treatment the latter condition should never be seen in this connection. Fulminating appendicitis may kill in spite of the best possible treatment that can be administered. The tendency of the disease is to recurrence. Resulting from repeated colds or inflammation, recurring catarrhal cecitis is established, with attacks of illness in this locality manifesting every few weeks or months, though the diagnosis may not be made absolutely clear in a single attack. The recurrence of pain in the McBurney region with moderate febrile manifestations, tenderness and tumefaction all go to establish the diagnosis of catarrhal inflammation of the cecum or appendix or both.

As a rule it is the fulminating variety only that destroys life, this being due to perforation of the gut or appendix from traumatism, depending upon the presence of unusual heat, particles of fecal matter, or foreign particles, as grape seeds, bits of bone or other hard and irritating substances that may have been taken with the food. On the whole, the prognosis of this disease in child-life may be said to be favorable.

Treatment.—The first symptom calling attention to cecal or abdominal trouble is pain as a rule. This is generally very acute, and may be located at the site of the commencing inflammation or in the umbilical region. It is after the character of colic, and generally occurs paroxysmally at intervals of two or three minutes. In some cases it is so severe as to cause the child to cry out with pain. Vomiting may occur simultaneously, and in fact is apt to be present as an early symptom. The combination of pain and vomiting will prompt the suggestion of acute indigestion, but the flexing of the right leg upon the body or the drawing up of both legs to secure relaxation will testify to something more than simple indigestion. A sharply defined chill is among the early symptoms, this being followed by a moderate rise in temperature, which never occurs in ordinary colic or other simple gastro-intestinal irritations.

Naturally it is the pain that excites attention, and when given for relief a serious mistake is made here in the administration of opium and other sedatives. The pain is due to oncoming inflammation and no more certain mistake can be made in the treatment of this inflammatory disease than to mask it by opiates. The facial expression of the disease is a necessary diagnostic, and

when benumbed by sedatives we are deceived as to the intensity and character of the attack, and danger to the patient is correspondingly increased. If ushered in by a chill, quickly followed by a fever, *Aconite*, *Ferrum phosphoricum* or *Belladonna* will be needed according to individual symptoms. If the pain is violently acute and the patient's suffering severe *Magnesia phosphorica*, *Colocynthis*, *Chamomilla* or *Belladonna* may be needed. Besides masking the case opiates increase constipation and check the normal secretions of the intestinal tract, with the result that the inflammatory process is more extensive and perforation is much more likely to occur. The indicated homoeopathic remedy is far better for the relief of pain in this and other inflammatory states than the sedatives of the old school. Purgations are highly objectionable. The bowels should be relaxed in so far as possible by the use of copious enema, either of plain water or water and oil, in order that all scybala shall be thrown off. Applications of heat over the abdomen are generally permissible, cloths wrung out in hot water medicated with *Hamamelis*, *Arnica*, or *Aconite*, as preferred, being applied over the inflamed area.

The blandest of diet should be used during the inflammatory state, if in fact the patient will take nourishment at all, and for a number of days before the inflammation subsides it will be well to give only liquids or foods that do not have an amount of residue in them, so that the cecum may have rest from the presence of fecal matter as long as possible. If suppuration threatens *Mercurius*, *Hepar sulphur* or *Silica* will be required; if typhoid symptoms supervene *Rhus tox.*, *Baptisia* and *Arsenicum* are to be thought of, as well as *Lachesis*, *Crotalus* and *Kali phosphoricum*.

Extensive differentiation is not here demanded. As with other inflammatory states this condition will have to be treated according to the individual symptoms, the more common of the remedies named being enough to prompt study and adaptation to individual cases.

Appendicitis often results in peri-typhilitic abscess. Wherever the symptoms point clearly to suppuration an exploration of the tissues by means of hypodermic syringe or other exploring needle should be made, and where pus is located a free incision should immediately follow, with thorough emptying and cleansing of the abscess. This should be practiced under strict antiseptics. The abdominal walls should be carefully washed and rendered aseptic by the application of cloths saturated in five per cent. of carbolic acid prior to the insertion. The cut should be made an inch or an inch and a half long, directly over the most prominent part of the abscess, care being taken to open the cavity sufficiently to allow the escape of its contents and easy and thorough drainage. The tissue should be incised with care; first the skin and superficial parts, the deeper layer being divided on a director. When

the peritoneum is reached it should be divided between forceps in order not to wound the intestine, this incision being afterwards enlarged by the scissors, or by the knife directed upon the finger. When the peritoneum is opened the pus will usually gush forth in quantity. When evacuated the cavity should be thoroughly washed with sterilized water. If the abscess is more superficial and has not involved the peritoneum the latter will, of course, not be entered. Thorough cleansing by the copious use of sterilized water is absolutely necessary, all pus and decomposing tissue being brought away. The appendix should be searched for and if increased should be tied off close to the cecum with sterilized silk, the severed portion being removed. It is well to introduce a drainage-tube for a day or two, armed with a piece of rubber dam, its calibre loosely occupied by absorbent cotton for the purpose of securing capillary drainage. The more complete the emptying, draining and cleansing of peritoneal abscesses the more certain the recovery of the patient. Perforation of the appendix with discharge into the peritoneum if unoperated upon means certain death in every instance. This condition belongs rather to the field of surgery than medicine, but in homeopathy it is possible to allay inflammation and prevent destruction and suppuration in so great a proportion of cases that resort to surgical measures is not often necessary in children. When they are demanded it is as a rule in children of strumous or tubercular habit.

Intervals between recurring attacks of the catarrhal variety may be increased by proper medication and their acuteness may be modified. As a rule the remedies demanded in the intervals between the manifestations of catarrhal inflammation of the appendix are the anti-psorics; *Calcarea*, *Sulphur*, *Arsenicum*, *Thuya*, *Parinum*, and *Silicia*. These should be given extending over a period of months, with *Aconite*, *Arsenicum*, *Ferrum phosphoricum*, *Gelsemium* and *Belladonna* as indicated for the acute manifestations. *Ferrum phosphoricum* is perhaps the best of the remedies named for the catarrhal variety, which does not present the acuteness of *Aconite* and *Belladonna* nor the malignancy of *Arsenicum* and *Lachesis*. By administration at occasional intervals extending over a period of months it often overcomes the tendency to recurring catarrhal inflammation, whether of this or other tissue of the body.

CHAPTER LV.

INFANTILE ATROPHY.

General Considerations—Symptoms and Course—Pathology—Dietetic Treatment—Medical Treatment.

General Considerations.—Infantile atrophy occurs almost wholly as a sequel to acute diseases, especially to diarrhetic diseases of infancy. It is most common in children from six to eighteen months of age. Older children rarely suffer from it, and younger subjects generally die or recover promptly from those diseases that result in marasmus in teething infants. The condition is characterized by extreme wasting of the muscular and other soft tissues of the body, the child becoming a mere living skeleton and so wizened-faced as to present an aged appearance. It is usually due to gastro-intestinal catarrh as a result of improper feeding, and is much more commonly seen in children of constitutional dyscrasie—those predisposed to tuberculosis or rickets—than in children who are healthy. It is not often seen in infants relying upon the breast, and is not as common in children fed on cow's milk as in those sustained by proprietary foods in which there is an abundance of starch. The disease is practically infantile starvation. Following upon an acute attack of cholera infantum or entero-colitis the child begins to emaciate. It is very hungry, partakes of its nourishment greedily, and may or may not have vomiting and diarrhoea, but it doesn't thrive; in the majority of cases intestinal catarrh continues, the food passing in but slightly altered condition, or as greenish mucus or biliary diarrhoea. In other instances atrophy seems to occur idiopathically, without having acute gastro-enteric catarrh of any variety as its cause; but careful investigation of these cases will reveal the fact that the child has suffered from passive dyspepsia, and that for some time previous to the commencing of emaciation its appetite was notional, it suffered belching and regurgitation of food, with perhaps occasional diarrhetic discharges, intestinal flatus and colicky pains. With artificially fed children, whether the food be cow's milk or domestically prepared artificial food, as arrowroot, barley water, oat-meal gruel, rice-water and other farinaceous foods, or whether the child be dependent upon proprietary infant foods in which there is a superabundance of starch, atrophy is much more commonly seen and follows closely upon acute dyspepsia or acute intestinal catarrh. The food is not all digested, and that which passes in an undigested state serves to irritate the intestines; unnatural fermentation follows upon partial digestion, with the

formation of irritant products; gaseous disturbances ensue, with occasional attacks of nausea and vomiting and disgust for food, and perhaps occasional outpourings of diarrhoea which, however, are not persistent.

Unless marasmus follows closely upon severe manifestations of gastro-intestinal disturbance atrophy is apt to creep on insidiously and without clearly defined initial course. The child is not well; its sleep is restless and disturbed; it whines and cries easily; its muscles are flabby and its skin hangs somewhat loosely on its thighs and arms; its chest begins to emaciate and its features look pinched and drawn, the skin fitting tightly over the bones because of a wasting of muscular and connective tissue beneath. No food seems to suit it though different preparations be tried. Stomatitis occurs as the case progresses; the child's mouth is red, even fiery red, and covered with tiny speckings of the aphthous form of the disease. Atrophy is much more likely to occur in frail children, or in those who have never been robust from birth. As already suggested it is more prevalent during the active eruption of the temporary teeth, from the fifth or sixth month of life, the drain upon the nervous system caused by the pain and irritation of teething and the physiological tax of tooth-formation upon that system tending to render the child less resistant, its digestive ferments less vigorous, and its muscular system easily debilitated. The stomach is unable to perform its part of the digestive process because of debility of the gastric secretions and muscular inertia of that pouch. This applies to the intestines as well, while the saliva and mouth juices are also weaker in digestive power and the food is not so prepared as to be easily assimilated.

When cow's milk is relied upon atrophy has been set up by the irritating properties of the heavy curd of the milk, as also by the excess of lactic acid belonging to improper fermentation, and perhaps by the admission into the system of noxious bacteria through the milk. When starch has formed the basis of foods the debility of the gastric ferments renders its complete conversion from lactose into dextrin impossible, the child suffering from lactic acid poisoning and from non-transformation of the starchy elements of food into dextrin which is easier of carbonification. So that while the child may take plenty of nourishment per os, nourishment apparently well suited to the infantile energies, its system fails to properly digest and assimilate the food given and it dies of slow starvation. Typical cases of infantile marasmus are among the most pitiable of the conditions of child-life.

Symptoms and Course.—If marasmus follows upon gastro-intestinal catarrh repeated occurrences of vomiting and diarrhoea interrupt its regular course. There may be present some reactionary fever. This is quite likely to be the case in tuberculous subjects, and occurs especially at night. The sleep is restless and

disturbed, the child is uncomfortable and in pain, and constantly hungry. It cries all night long with hunger; crowds its little fists into its mouth—which is soon red and inflamed in severe cases—frets, worries, rolls its head and tosses, suffering abdominal pain, and, if we may judge by its expression, from headache; moreover, if right in the midst of the teething period it is harrowed by all the distress incident to the eruption of the teeth through the maxilla and gums. The face soon becomes pinched, the lips pale, wrinkles showing about the mouth and eyes, the skin is dry, harsh and hangs in folds over the bones, the eyes are sunken, the fingers emaciate until they look like claws, and the head looks large, out of proportion to the body. The neck is thin, the skin hanging in folds and wrinkled about it; the angles of the jaw and chin look unusually sharp and pointed because of the tightness with which the integument is drawn over them. Every rib stands out until they can all be plainly seen, and, from cartilaginous and muscular emaciation, the child is sore to the touch and cries upon being moved or handled. Its spine is tender and on the vertebrae and hips the skin is so drawn that it is often red and glistening. The feet are edematous, the urine scanty, the anus and nates chafed and sore from urinal acridity and the alkalinity or acidity of the evacuations from the bowels. As the case goes on the prostration is extreme; the action of the heart is very weak, the pulse is rapid and feeble; the temperature shows some elevation; the abdomen is usually distended from weakness of its muscular walls, and the mesenteric glands are enlarged and can be felt like shot beneath the skin. In special cases clonic convulsions occur, while in others there are rolling of the head and eyes, tossing, restlessness, disturbed sleep, everted eyes, clenching of the fingers and even tonic convulsions, although these are generally not present because of the extreme debility of the infant. Death generally ensues from exhaustion; or the child lies in an exhausted and somnolent state with muscular twitching, strabismus and perhaps opisthotonos for several hours or a day or so before death.

Atrophy occurs in older children from other than acute gastro-intestinal causes, partaking more of the form of chronic indigestion. It is not seen except in subjects of tuberculous parentage, children who are predisposed to glandular enlargements, tubercles and other evidences of a bad history. Chronic nasal catarrh and perhaps a predisposition to cough may already be present. Weakly and debilitated children of from two or three years up to eight or ten are more likely to suffer. This form of atrophy is seen much more commonly among the squalid homes of poorer classes of the population of large cities than elsewhere. Children who are subject to it are of the tonsillar habit and strumous diathesis. It is very common among rickety children,

and although an occasional case may be seen among people in the better walks of life it is, as stated, almost universally limited to those living in unsanitary surroundings with improper nourishment and bad antecedent history. Commencing as simple dyspepsia there is capriciousness of appetite and perhaps anorexia in marked degree. In other cases the appetite is excessive, the child eating most greedily of unselected articles—anything it can lay its hands on. The abdomen is distended with gas, and nausea and vomiting of half digested food frequently occur. More often, however, diarrhea is present, the stools being but partly digested.

These children are generally pot-bellied, with large heads, sunken eyes and sharply defined features. The tongue is coated and patchy. Feverishness is not often seen in connection with this form of marasmus at first, but later develops so that there are nightly aggravations of the fever and the case seems more or less that of a case of hectic. Atrophic children are cross and peevish, don't care to play long at a time and are notional in all their desires; their sleep is disturbed, they are languid and ungainly, and emaciation sets in usually within a few weeks after the initial dyspeptic symptom, if indeed this can be traced. Diarrhea is more likely to be present early in the case than later. The disease is readily confounded with the intestinal catarrh of tuberculosis. The abdominal distension, occasional diarrhea, enlargement of the mesenteric glands, the feverishness at night, the mild hectic state, the capriciousness of appetite and the pot-belliedness belong to both diseases, so the diagnosis is not always easy. It is not impossible that infantile tuberculosis may light up or be indirectly responsible for the atrophy that is taking place, and before the case is terminated it will be so admixed that clear differential diagnosis is not possible. The presence of cough with the development of lung complications, unusual enlargement of the veins of the abdomen, and the defined enlargement of the mesenteric glands, more common to the tuberculous state, will favor the presence of tuberculosis as the cause if not as the only disease present. In atrophy belonging to intestinal derangement without tuberculosis the symptoms are more dyspeptic in character and the children are more likely to show disturbance of sleep, with nightly terrors, wormy symptoms, grinding of teeth, fright, headache and other symptoms of this class.

Pathology.—The pathological condition which is presented in the chronic form of gastro-intestinal catarrh, as this variety of atrophy is called, is swelling and injection of the mucous membranes of the stomach and intestinal tract. There is an excess of mucus throughout, this being frequently evidenced in the discharges which come from the bowels. The surface of the membrane is gray, with red speckings, the changes occurring especially about the junction of the ileum and colon. In the

latter it is pronounced about the region of the sigmoid flexure. The surface of the mucous membrane shows extensive masses of leucocytes and various micrococci imbedded in mucus. The blood vessels are distended and the glandular tissues and muscular layer are thickened. Following upon this swollen and injected condition of the mucous membrane of the intestinal tract it shrivels and atrophies, and destruction of its secreting glands occurs, the tubular glands being wasted and cicatrized so that they are incapable of proper performance of their function. In the marasmus of infants the mucous membrane is pale and the intestines are thin and translucent. The solitary glands and Peyer's patches suffer general atrophy and almost disappear. There may be minute evidences of effusion of blood in local spots, giving to the pale membrane the appearance of the hemorrhagic membrane in special localities. Minute ulcers occur in the stomach and also in the mucous membrane of the intestine, and in rare cases the membrane will be found to be covered in places by a film almost like the diptheritic exudate. As the atrophy becomes general the sabbler organs of the body suffer. Fatty degeneration of the heart and kidneys occurs, effusion into the brain may take place or softening of its structure may be the result. Thromboses occur in the various blood vessels, as in the lungs, kidneys and brain.

Dietetic Treatment.—Diet is of first importance in both infantile atrophy and the atrophy of youth. As has been seen both depend in a majority of cases upon chronic gastro-intestinal catarrh, largely due to faulty feeding, especially the administration of foods rich in starch, so that it will be very naturally understood that effective treatment must begin with a change to articles of diet that the infantile system can digest and assimilate. For this purpose the very blandest of nourishment will be required, the food being as free from starch as possible. If the child has been upon a milk diet this should be used very sparingly or discontinued altogether. If, on the other hand, a farinaceous food has formed the bulk of the nourishment administered this should be discontinued and milk and beef juices resorted to. Where the diarrhetic tendency still continues perhaps the best of all preparations in infantile atrophy is the beef peptonoids. The albuminoid digestion having been conducted in the chemical laboratory this preparation is in shape to be readily assimilated by the stomach with the least amount of effort on the part of the infantile system. The white of egg mixed with barley water or with rice-water and occasionally if constipation attends the condition of atrophy, as it sometimes does, it will be found that oat-meal gruel is best adapted to the case. It must be borne in mind that this type of food is apt to cause eczema, which, however, is generally transient and not of sufficient moment to interdict a nourishment upon which an infant may be thriving. Wherever barley, rice or oat

meal is selected the same should be thoroughly boiled, extending over a long period of time until it is succulent and its chemistry has been so changed that its nutritive elements are readily taken care of by the little patient. All gruels should be strained through two or three thicknesses of fine cloth in order that the irritating husks may be removed. Peptonized milk mixed with a decoction of arrow-root, adding fresh milk and cream with the peptonizing powder and arrow-root, serves as an excellent food in individual cases. The Mieg's milk and cream preparation is one of the best. Raw meat juices are not usually permissible, but both Valentine's beef juice and Bovinine have served me well in individual instances. Winchester's hypophosphites, plain, have answered a nice purpose, given in drop doses every four hours in water. Phillip's digested oil emulsion and unctions of the Squibb's cod liver oil are helpful in chronic cases. It is difficult to prescribe a set diet for infantile atrophy. The cases are so varied and individual idiosyncrasies are so pronounced that what is one child's food is another's poison, and it is only by the exercise of the utmost care and perhaps after repeated trials that the adapted food is found. Of the proprietary preparations Mellin's Food has served me to good purpose. Imperial Gramin and Lactated Food, although quite different in their chemistry from Mellin's, have suited individual cases where the latter disagrees. It is not always best to discard a food because it doesn't agree at once. Frequent changes have to be made and perhaps the food that disagrees at one time may be just that which is required two or three weeks later. Mellin's food may be given alone or with lamb broth, or admixed with liquid peptonoids.

In older children it is difficult to prescribe a diet because of the capriciousness of appetite and the ability to get hold of foods that are proscribed. It is necessary to bear in mind that these cases also demand change of food, the stomach soon tiring of a regulation diet. Over-indulgence is a bad fault, and one of the commonest difficulties in the way of the cure of atrophy in children out of the infant stage of life. Ashby and Wright have prescribed the following regular bill of fare for children of from five to seven years old, in whom indigestion is not over-severe, which will be found of inestimable value if followed sedulously:

BREAKFAST: 8 A. M. — A breakfast-cereal (8 oz.) of bread and milk, made from wholemeal bread; a teaspoonful of malt extract may be added; this may be followed two or three times a week by the yolk of a lightly-boiled egg and a slice of toast, or a piece of toast and dripping or lard or butter.

DINNER: 12 to 1 P. M. — A broiled mutton chop, beefsteak, or fresh white fish, with mashed potato, spinach, or French beans; to be followed by ground rice-pudding or a baked apple. Milk to drink.

TEA: 4 to 5 P. M. — A cup of cream and milk, with toast or stale bread.

SUPPER: 7 P. M. — A cup of beef-tea or mutton broth.

In the more severe and protracted cases it is well to avoid farinaceous food as much as possible, as recommended by Dr. Postace Smith.

BREAKFAST: 8 A. M.—Half to three-quarters of a pint of fresh milk, alkalised by twenty drops of the saccharated solution of lime; a slice of toast with yolk of egg, or fresh fish.

DINNER: 12 to 1 P. M.—A small mutton chop or boiled sole, a thin slice of stale bread, with half to a wineglassful of sherry or claret, well diluted.

TEA: 4 to 5 P. M.—Same as breakfast.

SUPPER: 7 P. M.—A cup of beef-tea.

Rachford, in the "Archives of Pediatrics," Philadelphia, formulates the following rules for the selection of diet in summer complaint, whenever it becomes advisable to discontinue the use of milk. These apply to atrophy as well as to the more acute forms of gastro-intestinal disease:

1. Avoid albuminous food (*a*) when marked constitutional symptoms are present; (*b*) when in doubt as to the character of the fermentation causing the disease; (*c*) when the stools are putrid; (*d*) when the stools contain mucus and blood; (*e*) when the nausea is constant and not relieved by vomiting.

2. Avoid carbohydrates as food (*a*) when there are marked constitutional symptoms present and the stools are continuously acid; (*b*) when there is much flatus, pain or urticaria.

3. When the albumins are to be avoided the carbohydrates are, as a rule, indicated; and when the carbohydrates are to be avoided the albumins are, as a rule, indicated.

4. Give such foods as cream, beef-broths and whisky (*a*) when the foods prescribed according to the above rules disagree; (*b*) during the first twenty-four hours in severe, acute cases; (*c*) when in doubt as to the character of the food indicated.

He considers the following foods and the indications given to possess great value:

Whisky, one of the most useful, never contra-indicated; especially useful in acute cases during the first twenty-four hours of treatment, but may be given at any time in either acute or chronic cases. In this I do not at all agree with him.

Meat-broths contain so little albumin and carbohydrates that they are never theoretically contra-indicated. They may be given at any time, in either acute or chronic cases, but they are especially indicated in acute cases after the first twelve or twenty-four hours' treatment.

Cream contains so little albumin that theoretically it is never contra-indicated. It can do no harm in any form of the disease, but will be found to serve the best purpose in chronic cases and after the third or fourth day in acute cases.

Barley water and oatmeal water may be mixed with milk to advantage, as they mechanically facilitate the digestion of casein. In this combination they may be useful in chronic cases and in convalescent acute cases.

White of egg is contra-indicated in all cases of summer complaint when there are marked constitutional symptoms present, or

when the diarrhea is putrid or mucous; but it may be used in the form of the disease dependent upon an abnormal acid fermentation, the indications of this condition being sour stools with pain, or urticaria, and the absence of constitutional symptoms. It may also be used as a permanent article of diet in infants incapable of digesting the casein of milk.

Ment juice is one of the most valuable and easily digested of the albuminous foods. It is indicated when the symptoms testify to the diseases having been caused by acid fermentation, and in chronic cases when other albuminous foods disagree. It may also be used as a permanent article of diet in infants incapable of digesting the casein of milk.

Sterilized milk in small quantities and greatly diluted may be used as an article of diet in many of the milder forms of summer complaint. The reason why milk does not frequently aggravate the disease when given in this way is because the casein and sugar are taken in such small quantities that they are thoroughly disposed of before reaching the seat of the disease in the intestinal canal. While many cases do well while fed in this manner I think an unnecessary risk is run in attempting to feed upon milk during the most acute stage of the disease when there are other palatable and less dangerous foods. But after the constitutional symptoms have subsided, and the most acute stage has passed, milk is indicated, and may be given as directed above.

The subjects of infantile atrophy usually demand climatic changes as well as cure in the diet. If living inland a change to the seashore with sea bathing is generally most helpful. The change to mountains is also desirable, though it will sometimes be found sufficient to leave the city and go to a farm or other country point close at hand when change to the seashore or mountains is not possible. Nightly oil baths are helpful and daily baths of sea salt, where other than the seashore is selected as a temporary residence, are also beneficial. A set diet must be followed with sedulous care if recovery is to be hoped for. This is more difficult in youths than in younger subjects, but is absolutely necessary in both, and the parent who relaxes the necessary stringency is not considering the best interests of the sufferer. Shower baths are invigorating and if the shock is not too great may be practiced, especially during the summer months. Atrophying children, whether infants or youths, should be kept in the fresh air just as much as possible. Their clothing should be comfortably warm and light. Light flannel night wear is necessary to prevent chilling. The sleeping room should be comfortably warm, but well ventilated and free from noxious odors. Exercise should be moderate, consisting largely of walks in the open air, indulgence in light games, drives in the country, and boat rides if at the seashore.

Medical Treatment.—Without proper attention to diet and hygienic medication directed toward the cure of atrophy, whether in the infant or older child, is certain to be defeated; but if common sense and intelligence be exercised in the matter of diet and general management the properly indicated homeopathic remedy is often capable of accomplishing good results and in most cases with satisfactory promptness.

The remedies most called for in infantile atrophy are the deep-acting constitutional anti-psoric, conditions calling for them being almost invariably present, the basis being the psoric state of the system. *Sulphur*, *Calcareo carbonica*, *Psorinum*, *Baryta*, *Phosphorus* and *Arsenicum* are especially applicable.

Sulphur is perhaps the basic remedy, and a moderate dose of a moderate or high attenuation will do more to arouse the dormant nervous system and set to work the vital forces toward better digestion and assimilation of food than any single remedy. The *Sulphur* child is hungry, viciously hungry; grasps eagerly at everything offered it in the way of food or drink, makes a pocket of its mouth for all articles of diet and for its fists and playthings, as though it were insatiable. Its abdomen is hard and distended, its skin sallow, dirty, and hangs shriveled and in folds. Discharges from the bowels excoriate and are offensive, even to putridity; the eyes are sunken, the skin drawn tightly over the face and the body emitting of an offensive odor. The fingers are emaciated, their ends clubbed; the child awakens from sleep frightened and screaming; objects to being bathed and is a deplorable object, emaciated and scrawny, old looking and shriveled.

Psorinum is very much like *Sulphur* in its pathogenesis and often promotes activity of the physical system where *Sulphur* fails though seeming to be the indicated remedy. The stools are horribly offensive, brownish and watery; child lies exhausted after stool; the odor is so offensive that it permeates the whole house; child shriveled and aged looking, as with *Sulphur*.

Calcareo carbonica has great emaciation with voracious appetite; child relaxed; perspiration about the forehead and neck and large, open fontanelles. The mesenteric glands are large and indurated. The child is debilitated but not as weak and wan as with *Sulphur* or *Psorinum*. Its general system shows enlargement, especially of the cervical glands. Its stools are clay-like and frequent. The characteristics of *Calcareo* are the sweat about the head, coldness of the feet and hands, and the clay-like stools. When these conditions occur during the teething period, especially, and more especially during the earlier months of teething, *Calcareo* is the basic remedy from which the best results will probably be obtained.

Phosphorus is particularly suited to children of blonde hair, especially girls, delicate, of slender structure with the *Phosphorus*

cachexia; diarrhea and relaxation of the arms; copious stools pouring away with force and followed by exhaustion; irregular heart-action and dry cough.

Pulsatilla is often beneficial in the atrophy of youths with pronounced dyspeptic symptoms, variable appetite, depression of the nervous system, with non-resistance and lack of effort on the part of the child to play or to interest itself in anything. Child is peevish and cries easily; fat foods especially disagree with it.

China is helpful where the debility follows acute gastro-intestinal disorders and is resultant upon the loss of vital fluids, especially the serum of the blood, as from cholera infantum. The stools are worse at night, copious, offensive and undigested; painless, gushing stools followed by great debility and prostration; appetite voracious and notional; hectic symptoms; feverishness especially at night; child idle and listless.

Baryta carbonica is more especially useful and applicable to subjects approaching the age of puberty in whom muscular atrophy is pronounced. The cervical and axillary glands are swollen, the chest is emaciated and cough is beginning to show as a symptom; great debility upon exertion; indifference to everything, with constant desire to sleep; aversion both to work and to play; dullness of memory, inability to learn properly at school; no interest in anything. Its subjects are slender with glandular enlargements.

Armenicum iodatum is particularly beneficial in the uretical case; brownish diarrhetic stools, painful and offensive, patient looks pale and waxy; weakness or constant desire to lie down; hectic fever and night sweats; palpitation of the heart and great weakness; inability to take exercise because of the weakness; limbs tremble upon efforts to hurry; heart palpitates and the child is easily out of breath; the eyes are sunken and glassy; sleep is restless with tossing to and fro. The chest is emaciated and in youths, and even very young children, a hacking cough sets in; crepitant or subcrepitant rales distributed over the upper parts of the chest, with commencing hepatisation.

Besides these remedies *Lycopodium* is especially beneficial in the atrophy of children following upon measles, and in that of young children tending to quick consumption. Unhealthy appearance of the skin; flatulent dyspepsia; abdomen distended from weakness of its muscular walls; afternoon fever and hectic. *Natrium sesquicarbonicum* is characterized by rapid emaciation of the neck and limbs; skin hangs flabbily over the neck and thighs; emaciation is rapid, out of proportion to fever and diarrhea. *Strychnum* will be found helpful in the asthmatic cough of infantile atrophy and also in the gastro-intestinal symptoms simulating the wormy state of child-life. *Staphisagria*, *Graphites*, *Kreosotum*, *Phosphoric acid*, *Antimonium crudum*, *Argentum nitricum* and *Kali*

Phosphoricum and *marianicum* may be needed in individual cases. *Silicæ* will sometimes set up reaction when both *Sulphur* and *Calcarea* fail. It is especially adapted to the rachitic subjects who form a large proportion of atrophied children. *Calcarea phosphorica* is more especially suited to the *Calcarea* subject in whom bony development is retarded, and the teething process is late; children with large heads and open fontanelles; children unusually slow to walk (*Silicæ*); the subjects of moderate diarrhea and general muscular emaciation with bow-legs and bulging or pigeon-breasted thoraces. *Iodium* either in combination with *Arsenicum* or *Baryta*, or alone, is to be thought of in the atrophy of youths and young subjects who tend toward the development of tuberculosis. Cod liver oil is usually beneficial in these cases because of the iodine it contains, and should not be forgotten.

Infantile atrophy is slow of recovery and requires great patience and forbearance on the part of the parents and the physician, as well as great painstaking on the part of the latter in the selection of the remedy.

It must be borne in mind that it is highly essential to seek and find the individual miasm that is behind the case, whether it be tuberculosis, syphilis, sycosis or rickets; and no matter what the remedy may be that is demanded for the control of individual symptoms the basic treatment will depend upon the constitutional dyscrasia and will require the occasional exhibition of suited constitutional medicine as an intercurrent remedy. *Thaps* is especially applicable in the sycotic child. The stools are pale, yellowish and watery and forcibly expelled with gurgling noise; aggravations occur in the morning soon after breakfast; the teeth early decay at the roots; the child exhausts rapidly and emaciates rapidly. *Thaps* will often start improvement in obstinate cases of chronic infantile diarrhea. *Lauro cerasus* is another deep acting remedy for acute atrophy, with pronounced debility occurring quickly. Its characteristic symptom, "drinks roll audibly into the stomach," means more than is expressed in these words, indicating such a degree of debility that the pharynx and esophagus do not contract upon liquid foods. *Picric acid*, *Natron sulphuricum*, *Argentum nitricum* and *Aethusa* may also be called for in individual cases.

CHAPTER LVI.

INTUSSUSCEPTION.

General Considerations—Symptoms and Course—Diagnosis—Treatment.

General Considerations.—Invagination of the bowel is the commonest cause of intussusception or obstruction in children. Obstruction may occur from adhesive bands, resultant upon some inflammation of abdominal viscera, and upon the chronic cicatrizing form of peritonitis; but most commonly involution of the intestine is the cause of obstruction when it occurs in infancy. The infant intestinal walls are thinner than later in life, and if by peristalsis a portion of the intestine has become invaginated it is much more apt to be carried further down the tube than in older subjects. It is more common in the earlier years of child-life, and in the latter months of the first year is more often seen than in any other equal period of time. It is much more common in boys than in girls—this fact being difficult of explanation—and is attendant upon diarrhetic and constipated states with about equal frequency. The invagination is always in a downward direction, the greater freedom of movement of the infant intestines in the abdomen than is possible in older life unquestionably acting as a predisposing cause to the accident. The site of the trouble is not infrequently near the ileo-cæcal valve, the ileum entering the cæcum, not pushing its way through the cæcal valves but pushing the cæcal valves before it. It drags the mesentery along with it, and both are carried clear on into the colon, the cæcum often forming the inverted middle layer of the invagination, the ileum the inner, and the colon the outer. The mesentery being dragged into the larger gut with the intestine, the latter is crowded to one side, and, as a result, becomes congested, edematous and of a dark red color, extravasation of blood occurring. Lymph is thrown off by the serous surfaces and a local or general peritonitis is set up, the whole forming a considerable sized tumor, usually discernible by palpation at the site of the obstruction which occupies the long axis of the bowel. If the obstruction is complete, the large intestine being wholly occupied by the smaller and its mesentery, necrosis from compression may occur within a few hours, with all the symptoms of collapse and perforation; whereas, if the intussusception is incomplete, the intestine preserving in part its patency, the case may drag along for some weeks in variable state.

Symptoms and Course.—Pain is usually the first manifestation of intussusception. This is variable in intensity, at first manifesting as what appears to be simple colic, or acute or subacute

enteric inflammation, lasting over a day or two, the pain suddenly intensifying, the child crying and screaming violently and vomiting and straining as if at stool. After emptying the contents of the lower bowel it continues to strain and only blood and mucus are passed. The pain is paroxysmal, recurring every few moments with violence, and nearly always attended by vomiting. The abdomen is distended and careful palpation will reveal some enlargement in the way of an elongated tumor, which is movable and not generally very tender, more often located in the left hypochondriac region or between it and the umbilicus. Digital inspection of the rectum will sometimes reveal the presence of a tumor at the point of the finger during severe active straining. The position of the tumor varies, and it also varies in length according to the extent of invagination and its location. It is most often felt in the colon where it is close above the umbilicus and on the left side. If peritonitis sets in early the temperature is elevated two or three degrees or higher, but from invagination alone it may be normal or subnormal. Unless relief obtains under proper treatment, or spontaneously, the pain, vomiting and straining continue until the child is exhausted and collapsed, with a pinched expression of countenance, sunken eyes, coldness of extremities, and complete relaxation of its entire system. In individual cases death occurs within twenty-four or forty-eight hours; in others the case drags along for three or four days. Convulsions sometimes ensue during the course of the obstruction, and vomiting of fecal matter may be seen. Especially is this likely in children who are older. The onset is sudden, the stomach first emptying itself of its contents and, finally, because of severe retching and straining at vomiting, the contents of the intestine are emptied into the stomach and ejected per oram. The abdomen is not usually distended nor sensitive over a large area; the pain and swelling are localized, and in children not over-fleshy there will be but little difficulty in diagnosing the condition. If intussusception occurs in an infant and is of the ileo-cecal character the symptoms are less acute. There may be obstruction of the bowels with attacks of colic and vomiting, and slimy and bloody-mucus stools may be passed. If the obstruction be not complete the case may drag over a long period of time, the child suffering recurring attacks of colic and pain with vomiting and constipation, diarrhetic or dysenteric stools occasionally occurring.

Diagnosis.—The suddenness of vomiting, the pain and straining, and the presence of a tumor occupying the axis of the bowel, especially in the left hypochondrium, make the diagnosis of intussusception reasonably clear; but it is often impossible to differentiate it from other acute inflammatory conditions, and not unless fecal vomiting or the emission of fecal odor from the mouth is present is the diagnosis made certain. The tumor already spoken

of is soft, doughy and tumefied. It may be as large as a pullet egg and is of the shape of link sausage.

Treatment.—The treatment of intussusception will depend upon whether the case be acute or chronic. In intensely acute cases the pain and paroxysmal contraction of the intestines will call for *Belladonna*, *Nux Vomica*, *Coccythia*, *Magnesia phosphorica*, *Caprum* and *Gelsemium*. If tenesmus is exceedingly severe, tending to increase the invagination, *Aloe* or *Mercurius corrosivus* may be necessary. In order to be effective treatment will have to be directed toward the relief of the invagination in the earlier stages in the acute case, and remedies that will allay the nervous irritation, which increases the contraction of the bowel and retards the inflammatory process, will alone be useful. It is an open question whether very much can be accomplished by internal medication in this class of case, and yet it is all that is left in the way of anti-inflammatory treatment, since mechanical means, whether after the order of laxatives, acute purgatives or abdominal massage are only apt to increase the trouble. Spontaneous reduction sometimes occurs, and doubtless the use of anti-spasmodics, as *Belladonna*, *Gelsemium*, *Acetate* and *Ferrus phosphate*, have proven beneficial in individual cases. *Nux vomica* is also among the best remedies in the very early stage but is not so useful after inflammation has set in.

Efforts at reduction may be made by inverting the child and applying gentle external taxis. The child may be held by the ankles, head downwards, and by gentle kneading and stroking-manipulations of the tumor through the abdominal walls, or by sudden jerkings or shakings of the child attempts may be made to dislodge the invaginated gut. Anesthesia may be practiced during these manipulations, and in some cases benefit will be derived by applying hot fomentations over the site of the invagination.

The bowel may be distended by hot water administered by enemata, the child's hips being elevated at an angle of forty-five degrees, while as much as one and one half or two quarts of water are allowed to flow through a fountain syringe elevated at a distance of several feet. In very young children as much as a pint and a half or two pints will suffice. The water should be comfortably warm, and may be medicated or not according to the discretion of the physician. The inflation of the intestine by air, passed through the nozzle of a pair of ordinary bellows, has been practiced with success in individual instances. The danger is over-distension of the intestine and rupture at the site of the invagination, especially if softening of tissues shall have occurred. If water is used it is best to have the abdomen kneaded or manipulated by an assistant while the water is allowed to flow, especially about the site of the invagination. If as much as twenty-four or thirty-six hours have passed since the manifestations of acute symp-

toms, these manipulations must be exceedingly gentle lest rupture occur, as the tissues will be somewhat softened by that time.

By far the most successful method of relieving intussusception and saving life when it has occurred, if the application of the properly indicated homeopathic remedy is unsuccessful, is celiotomy and the relief of the invagination by surgical measures. The bowel should first be emptied and the abdomen opened at the median line. Examination of the intestine throughout its entire course should be made within the abdomen, or if necessary external examination should be continued until the site of invagination be located. Gentle traction is permissible if the bowel is still in a fairly healthy condition; it will often unlock the invagination, thus overcoming the trouble. If there is a great deal of tumefaction traction may cause rupture of the intestine, while if it is already in a necrotic state the diseased portion will have to be removed and intestinal anastomosis performed or an artificial anus be made. This is among the capital operations of surgery and reference to modern surgical works is recommended.

Chronic intussusception is occasionally seen, its duration lasting over weeks or months. In these cases the calibre of the bowel is not altogether encroached upon by pressure, and there is sufficient patency to admit of moderate passage of the intestinal contents. Spontaneous recovery has followed upon invagination-slaughting, but these cases are among the curios of surgical literature. Where invagination is of moderate severity, especially where occurring in the rectum, it is desirable that all forcible efforts at stool be avoided, preference being given to the recumbent position during the passage of stool. The feces should be kept liquefied by the use of enemata containing oil, while the indicated constitutional medicine should be administered over a long period of time in order to overcome any sub-acute inflammatory state and to so tone the bowel that spontaneous recovery shall be rendered more possible.

CHAPTER LVII.

PERITONITIS.

General Considerations—Symptoms and Course—Treatment.

General Considerations.—Inflammation of the peritoneum occurs occasionally in child-life as a primary disease, but much more commonly as secondary to other acute illness or to injuries. In earliest infancy it is the result of inflammation of the arteries of the umbilicus and omphalitis. While not commonly seen in private practice from either of these causes it is by no means rare among people who live in squalor and filth, and is also seen quite commonly in foundling asylums. Whether from erysipelatous omphalitis or from acute inflammation of the arteries through umbilical infection it is dependent in both instances upon an unhealthy condition of cord and navel, altogether preventable by proper attention at birth and at the time of the separation of the cord from the abdomen. Acute peritonitis also occurs from suppurating mesenteric glands, by way of umbilical infection in tuberculous children. It is very often the result of typhoid fever from minute or large perforations of the intestines with emptying of their contents into the peritoneum, and is an invariable accompaniment of appendicitis resulting in perforation. It occurs from cold in young children who are exposed to sudden changes of the weather, and from improper food and clothing; but while it seems to occur here altogether idiosyncratically it is not unlikely that there has been bruising of the peritoneum by a fall or blow or kick, or injury of some kind, peritonitis being lighted up as a result of self-bacterial infection. When occurring independently of typhoid fever, appendicitis or omphalitis, and even when following upon the latter disease, it is much commoner in tuberculous and rachitic children. It is seen also in tubercular subjects in conjunction with pneumonia and suppurative pleurisy, the empyema emptying through the diaphragm. It is occasionally seen in connection with pus in the pericardium, from ulcers in the stomach, and also following upon intussusception. It is not often observed in connection with diphtheria or scarlet fever, but follows upon suppurative inflammation of the kidney, whether dependent upon either of these diseases or not.

Symptoms and Course.—Peritonitis usually sets in with pain, vomiting, tenderness in the abdomen, referable to the region of the umbilicus, and sometimes acute diarrhea. It is now well understood that extensive inflammation of the peritoneum may occur without much suffering, and for this reason the condition is

sometimes overlooked in child-life and in adults as well. Vomiting is the most constant symptom, and distension of the bowels, to such degree that the intestines may be readily mapped out through the abdominal walls, is early present. This must be differentiated from obstruction, the intestinal distension being much more general than in the latter, which shows as a more distinct tumor at some special site. The vomiting will consist of the food that has been administered as a partly digested mass, together with bile and sour-smelling intestinal contents. But unless directly dependent upon intussusception fecal vomiting never occurs in general peritonitis. There will probably be chills or repeated shiverings intermingled with heat, associated with abdominal tenderness and distension, and perhaps acute pain in the region of the navel, although this may be altogether absent. The temperature is moderate in range, not going above 101° or 102° , though in fulminating peritonitis it may quickly climb to 105° or 106° . The features are quickly pinched and sunken, the face assuming rather a dusky hue, with dark red spots upon the cheeks, as in hectic, though darker and larger and showing capillary paralysis upon pressure. The eyes are glassy and staring, the mind usually perfectly clear, the limbs drawn up, to relieve the abdominal distension, and in some cases anguish and anxiety attend. If dependent upon appendicitis the greatest pain will be in the appendical region; if upon pleurisy the first evidences of pain and peritoneal inflammation are likely to be where the abscess has burst through. In general peritonitis the pulse is usually very rapid and thready, the heart's action tumultuous, yet irregular and feeble, the patient sinks quickly and dies early of collapse, with the hands and arms cold to the elbows, the feet and limbs cold to the knees, even to the thighs which may be icy cold. In some cases the bodily heat is intense while the extremities are cold and clammy and the pulse altogether absent from the wrist for hours before death. If resultant upon pleurisy there are apt to be sharp, stabbing pains in the region of the affected side. Acute pleuritis may be mistaken for peritonitis, but the absence of abdominal tenderness and the disposition to draw up the knees, with the absence of general distension of the abdomen, will quickly differentiate the two. The pain of intussusception is much more sudden and acute than in peritonitis, and the swelling and tumefaction of an elongated tumor will make clear the diagnosis from the general abdominal distension of peritonitis, while the early presence of fecal vomiting which belongs only to obstruction will assist in the determination. If the symptoms of intussusception be not pronounced it may be more difficult to differentiate it from diffuse peritonitis.

In the course of acute inflammation of the peritoneum, which is almost invariably fatal, suppuration may take place; in other

cases there may be found within the peritoneum considerable quantities of fluid lymph. If this be thrown out and fail to break down extensive matting of the intestines may take place from this cause.

Treatment.—Diffuse peritonitis in child-life is exceedingly fatal and the prognosis is grave in every instance. If it depend upon perforation of the intestine in acute enteric fever there is little hope from any, even operative, procedures. If from perforation of the appendix and the case is seen early there is possibility of recovery. This is less true if it occurs through perforation of the pleura and diaphragm from empyema; here it must be seen unusually early and recognized quickly in order for operative measures to be of the slightest avail. Idiopathic peritonitis occurring from mild traumatism or from acute cold is more amenable to treatment, and where inflammation of the peritoneum occurs in connection with inflammatory states, as it sometimes does, without perforation or intussusception of the intestine, it is possible by prompt measures to effect occasional cures. In giving the prognosis the cause is most important, and in instituting treatment it is likewise of paramount importance. Occurring from perforation from other than typhoid causes immediate surgical interference is demanded, together with the administration of the selected remedies. Occurring idiopathically from traumatism *Arnica*, *Aconitum*, *Bryonia*, *Rhus tox.* and perhaps *Gelsemium* may be demanded. Occurring from cold, *Aconite*, *Ferrum phosphoricum*, *Belladonna*, *Bryonia*, *Terebinthina* or *Veratrum viride* may be exhibited with salutary effect. Especially applicable when ushered in by a chill followed immediately by a high fever and other evidences of intense inflammatory action are *Aconite* and *Ferrum phosphoricum*. *Belladonna* may be required for acute peritoneal pain, and *Magnesia phosphorica*, *Chamomille* and *Codonyathis* may also be useful in this connection. Injuries to the peritoneum demand *Arnica* and *Rhus tox.* The profound collapse belonging to severe peritoneal shock or infection may need *Camphor*, *Arsenicum* or *Veratrum album*; *Carbo vegetabilis* will also often be an excellent remedy in this connection. For the peritonitis of acute sepsis *Arsenicum*, *Carbolic acid*, *Lachesis* and *Kali phosphoricum* will be most beneficial, if indeed medical treatment be of any avail. External applications may be found helpful in relieving pain, as dry or moist heat, with or without *Arnica* or *Hemlock*. If constipation is inveterate plain enemata may be used to clear the lower bowel. Opiates are never in order because they retard retrograde metamorphosis and tend to lock the secretions.

CHAPTER LVIII.

CHRONIC PERITONITIS.

General Considerations—Abdominal Dropsy—Cicatrizing Type—Symptoms and Course—Diagnosis—Treatment.

General Considerations.—Tuberculous children are subject to a chronic manifestation of peritonitis, the course of which extends over a number of weeks, and depends in many instances upon slight injury to the abdomen. It also arises from various acute diseases, especially ascites. Peritonitis may also occur in connection with this affection without being of tuberculous origin, though as a rule the ascitic variety of peritoneal inflammation has tuberculosis as its basis.

It presents commonly in one or two forms, either the ascitic variety, distinguished by the presence of a large amount of dropical fluid in the peritoneum, or as the form known as the cicatrizing variety, in which the omentum and peritoneum are thickened and indurated and there is matting together of the abdominal organs with little or no fluid present. The difference between the two is that in one case the tuberculous process throws out a large amount of ascitic effusion while in the other lymph is deposited, it serving to mat together the abdominal contents and peritoneum.

Abdominal Dropsy.—In child-life, when not directly dependent upon scarlet fever or the kidney complications which follow, it is almost invariably due to tuberculous degeneration or tuberculous inflammation of the peritoneum. It is not very common in early infancy, but is seen from the second year up to puberty. Symptoms of dyspepsia will usually have been present, together with irregularity of the bowels and intermittent attacks of feverishness. The child is languid, has headaches and is indifferent to objects that ordinarily interest it. With the headache there will be fever, not very pronounced, some abdominal pain and tenderness, and gradual distension of the abdomen. This will at first be thought to be gaseous, but examination while the child is lying upon the back will reveal tympanitis anteriorly with dullness laterally, the intestines floating against the surface on the ascitic fluid. In well marked cases the distension is considerable, the abdominal veins are enlarged and the umbilicus protrudes. Pain is not the pronounced feature of this type of case, but more or less tenderness is present while the general appearance of the child is that belonging to ascites from other causes. In some cases cough attends, though usually the tuberculous process is limited to the peritoneum; this will cause distension of the abdomen and dropsy-

cal accumulation extending over a period of weeks or months. Where the directness of tuberculous history of the child renders recovery uncertain these cases are unusually protracted, though complete recovery sometimes follows.

Cicatrizing Type.—The second variety of tuberculous inflammation of the peritoneum is that in which lymph is effused instead of ascitic secretion. This form of peritonitis is generally chronic, with occasional acute manifestations, and rarely is a case seen in which the whole course of the disease is actively pronounced. There is more pain in the abdomen than occurs in the ascitic variety, largely referable to the umbilicus, and hectic symptoms, as chilliness with fever and sweats, together with attacks of diarrhea and nausea, occur in the course of the disease. If the exudation is pronounced an indurated mass may be felt through the abdominal walls. There is sometimes considerable distension with gases but no accumulation of fluid. In individual cases distinct, matted tumors can be felt; but in general the abdomen is collapsed, at least flattened, and only irregular induration of the omentum is to be felt on palpation. Not only is the pain greater than in the ascitic variety but the fever is more pronounced, rising in the evening to 102° or 103° . Emaciation is also more rapid and general. The course of this form of chronic peritonitis is marked by alternation of aggravation and improvement extending over several months or perhaps a year or more. The improvement is so pronounced that it will often be thought that recovery is certain, when there will be a sudden acute lighting up of the symptoms, with increase of pain in the abdomen, more fever, some diarrhea and a general hectic state, with greater emaciation than before, death finally occurring from ulceration of the bowels or local abdominal abscesses, or, perhaps, from involvement of the liver, lungs or kidneys.

Symptoms and Course.—The course of both of these varieties of peritonitis is protracted. Occasionally tubercular meningitis or acute pneumonia presents as an intercurrent disease and causes early termination. Recovery ensues in a fair proportion of both varieties after a long period of time, but the presence of recurring attacks of diarrhea, continued hectic fever, progressive emaciation and the lighting up of lung, kidney or brain symptoms usually insures a fatal issue.

Diagnosis.—The ascitic variety will have to be differentiated from chronic diseases of the liver that result in general abdominal dropsy. The previous history of the case will usually settle this point. If the liver is enlarged it will extend well over into the abdomen and down as far as the umbilicus, or lower. There is also more likelihood of diarrhea in connection with diseases of the liver, as well as jaundice and other symptoms referable to that organ. The presence of tuberculosis in the child's gentalogy will

assist in determining the diagnosis of tuberculous peritonitis. All the abdominal viscera may be glued together by the outflowing of lymph and the deposit of tubercles that take place in the form of chronic peritonitis known as the cicatrizing variety. The adhesions are very extensive; the intestines and stomach may be glued to the abdominal wall, and the liver, diaphragm, intestines and spleen all connected by extensive adhesions. These are so dense that it is sometimes impossible to separate them, and in the interspaces between adhesions and viscera there may be considerable collection of a cloudy serum or pus. Obstruction of the bowel may arise from cicatrizing bands that form from this variety of peritonitis, adding to the complications of the case and necessitating surgical interference. Upon opening the abdomen care will have to be exercised lest intestines or viscera that are agglutinated to the abdomen be cut into.

Treatment.—The treatment of these forms of tuberculous manifestation will be practically the same as that of general tuberculosis, plus the application of remedies directed toward the exudative and aseptic processes. In the latter it may be necessary for the comfort of the patient, and the proper performance of his functions, that the dropsy be carried off by moderate catharsis, or under the use of remedies that tend to promote dropsical absorption. For the former perhaps *Elaterrum*, *Apocynum*, in material doses, *Podophyllum*, *Leptandra* and *Croton tiglium* may be required. *Apocynum*, *Arsenicum*, *Apo*, *Terebinthina*, *Arsenicum iodatum*, and other remedies, may have to be considered in connection with the absorption of the dropsical effusion. In a general way, however, the administration of *Iodum*, *Arsenicum iodatum*, *Calcarea carbonica*, *Silicia*, *Phosphorus* and *Thuja* will affect the basic treatment. The hectic symptoms may demand *Hepar sulphur*, *Ferrum phosphoricum*, *Arsenicum*, *Acute*, *Silicia* or *Calcarea sulphurica*; while individual symptoms, as dyspepsia, diarrhea, constipation, nightly aggravations of the fever, progressive emaciation, and other individual symptoms and conditions may have to be prescribed for quite independent of the tuberculous state.

Nourishing diet, exercise in the fresh air, as the subject is able to stand it, and change to proper climate are required. Carbonizing foods, those supplying the greatest amount of nitrogen with the least amount of effort on the part of the system for their digestion, will be found most helpful, the dietetic prescription for general tuberculosis applying with force to the conditions here presented.

CHAPTER LIX.

DISEASES OF THE LIVER.

General Considerations—Jaundice—Symptoms and Cause—Ophthalmic Jaundice—Congestion of the Liver—Treatment—Medication—Diet.

General Considerations.—The liver is not subject to many diseases in childhood, yet occasionally acute inflammatory congestion of the liver, hepatic torpor, jaundice, liver abscesses and even cirrhosis of this viscus are seen in child-life. Hydatids of the liver also have their origin during child-life in a fair proportion of cases, even though the symptoms are not developed until later in life. Catarrhal inflammation of the gall-duct may also occur, but gallstones are fortunately not seen in children. In certain lithemic states the liver may be at fault, and in chronic malarial infection it is generally considered involved. Errors in diet, as excess of rich foods and the administration of stimulants, in young children frequently result in hepatic congestion; sudden checking of diarrhea or dysentery by the use of opiates or astringents may result in abscess of the liver. Passive congestion with jaundice is a symptom belonging to many of the acute diseases of child-life, especially the eruptive fevers. The worst case of infantile jaundice I ever witnessed occurred in a Jew child in connection with scarlet fever. It is especially common to children in Southern and Southwestern portions of our country, as infantile hepatic torpor in connection with the remittent and intermittent fevers of childhood. Cirrhosis is caused by the use of highly-seasoned foods during childhood in children with bad antecedent history, the cirrhotic state being lighted up by the development of ptomaines. Jaundice occurs also from scarlet fever and tuberculosis.

The general symptoms of liver disease in children are those presenting in adult life. It is not often that acute pain is met with in this organ, though it is expressed in acute inflammation followed by suppuration, is sometimes present in acute congestion of the liver, and is observed in syphilitic diseases of the capsule. Hepatic pain is usually felt in the shoulder or under the right shoulder blade in the course of the phrenic nerve. It may be expressed in the right hypochondrium, also. Upon physical examination it is always experienced in this locality. Hepatic pain is frequently associated with pleurisy and spasm of the pleura, and also with gastralgia and neuralgia of the diaphragm. If the pleura or lung be involved the pain is increased by coughing and taking deep breath. In liver abscesses the pain is more circumscribed

to the inflamed spot, while in phlebitis it is more diffuse, with a general sense of weight and fulness.

The milder disorders of the liver are not manifested by pain or other sensations confined to the hepatic region but more commonly by a general appearance of pain, and later by the condition of the alimentary tract. "Bilious" children are sallow in color, dull and listless, have loss of appetite, bitter or foul taste, heavily furred or coated tongue, with white or yellowish, pasty coating; the tongue is thick, flabby imprints of the teeth show against its edges, and the bowels are usually constipated, although hepatic diarrhea may be attendant upon the bilious state. It is possible for children of unusual torpid habit to suffer from hemorrhoids and constipation.

It must be borne in mind that the liver is very much larger in child-life in proportion to the size of the body than in adult life, hence in making a physical examination the liver will not necessarily be pronounced diseased even though it be considerably out of its adult location. The upper portion of the liver will extend to the fifth rib in the middle clavicular; to the sixth in the axillary region; and to the seventh in the scapular; this latter portion extends two inches below the blade in the median line. It is well over to the umbilicus and in some children extends beyond the median line without showing the least symptom of sensitiveness or inflammation. If the liver is very much swollen the lower part of the thorax will be distended and the right hypochondrium will be considerably enlarged. The epigastrium is also distended and in liver abscess or hydatid disease irregular enlargement, tumefaction, fluctuation, and perhaps well developed tumors may be found in the left lobe of the liver as a swelling or projection of the ribs, or at the upper margin of the liver. The liver moves up and down with respiration, a point of clinical value in differentiating tumors of this character from tumors of the abdomen. In cirrhosis of the liver the edges of the organ are sharp and hard, while in fatty liver they are soft; in abscesses a surface enlargement is felt while in hydatid disease boxes may be detected. It is sometimes quite difficult to determine the difference between abscess of the liver on its upper surface and abscess of the pleura. Perhaps not until the rupture of the capsule and pleura, with passage of the contents from the liver through the lungs from hepatic abscess, will the character of the trouble be distinctly understood. The pus from liver abscess is generally reddish-brown, containing leucine or tyrosine and characteristic liver cells. If due to dysentery the mæla of this disease will be found in its contents.

Jaundice.—Besides the infantile jaundice described under diseases of the new-born jaundice occurs in connection with many conditions of infancy. Simple congestion of the liver, catarrh of the membranous lining of the ducts, or other congenital obliteration,

obstruction from the presence of round worms, yellow fever, malaria, and occasionally scarlet fever and general septicæmia, poisoning from phosphorus and the various poison-serpents are attended by jaundice. The skin is of a yellow hue, varying from a light lemon yellow to a dark olive, the more emphatic the more severe the attack. It is generally seen on the face first, especially the conjunctiva. In severe cases the mucous membrane is yellow and the perspiration is so saturated with bile pigment that the clothing is affected by it. The urine is so heavily charged that it is brownish-yellow or of almost greenish tinge. The more severe the jaundice the paler the stools, which are almost entirely free of bile pigment. They are offensive, pasty and pale or greenish in color. Weakness is a characteristic symptom of jaundice, the degree of prostration being in direct proportion to the discoloration of the sclerotic. The sympathetic nervous system is disturbed so that breathing is interfered with and the heart's action is slow and heavy, the pulse-rate even falling to one-half its normal range in severe cases. Coldness of the skin, dullness of the intellect, sluggishness of the bowels, reactionary diarrhea, torpor with loss of appetite, soporific sleep and general physical and mental sluggishness are attendants upon this condition. The urine shows albumin as well as bile, the latter being discoverable not only by sight but by the addition of fuming nitric acid, showing the characteristic play of colors due to the iridescence from its oxygenation. The tongue is usually foul and coated; there are loss of appetite, nausea, eructations, flatulence and gaseous distension. Irritation of the pigment upon the skin causes intense itching, and in grave cases the lack of proper performance of the glycogenic functions of the liver sets up a gradual marasmus, the child becoming emaciated and wan, with enormously distended liver and abdomen and saffron hue of the skin, which is dry and shriveled, taking the name of yellow atrophy.

Jaundice may be caused by catarrhal swelling of the mucous membrane, resulting in occlusion of the bile-ducts. The inflammation may begin in the stomach and extend to the duodenum and bile-ducts, the condition being one of occlusion due to duodenal catarrh. The bile-ducts may be obstructed not only by swollen membrane but also by plugs of inspissated mucus, and the bile be thus retained within the liver and gall-bladder, the liver being enlarged and tender. These symptoms disappear as the bile is absorbed and distributed throughout the system. The gall-bladder will be so distended as to present as a distinct tumor, absorption subsequently occurring, leaving it filled with a gelatinous mucus.

SYMPTOMS AND COURSE.—The symptoms and course of jaundice will depend much upon its causative factor. If occurring from catarrhal inflammation of the bile-ducts, from exposure, from

changes of the weather resulting primarily in simple congestion of the liver, its course is acute and may last over a few days only. It is ushered in with a chill or chilly sensation, quickly followed by moderate fever, aching of the limbs, headache, nausea, and moderate pain in the hepatic region. If occurring epidemically, as it at times seems to do, its symptoms are more pronounced and there will be sudden vomiting, headache and pain in the epigastrium, offensive diarrhea, or perhaps constipation, the course of the case lasting from ten to twelve days. This catarrhal form may occur sporadically, or it may appear endemically or epidemically, bearing direct relation to diseases like typhoid and typhus fever. The fact that it occurs in a considerable number of children in the same school or family would seem to show that it is, to a moderate degree at least, infectious.

Diagnosis.—The diagnosis is not difficult; the yellow color of the skin with the pearly conjunctive, which soon show a yellowish tinge, the liver tenderness, the nausea, foul tongue and urinal saturation make the case clear. This form of the disease is rarely attended by secondary conditions, generally clearing up in a few days as do most catarrhal inflammatory processes, responding rapidly to the treatment given and not being followed by relapses or recurrences.

Infantile jaundice may be of the simple variety, due to a distension of the blood vessels of the liver occurring within a few days after birth, in which the ductus venosus is less potent than it should be. Rapid absorption takes place from the bile-capillaries so that the urine is loaded with pigments and the skin shows the characteristic yellow hue, sometimes as early as forty-eight hours after birth. In severe cases the stools are clay-colored and the conjunctive are stained yellow.

If due to the obliteration of the bile-passage the condition is more important. There may be general narrowing of the lumen with sluggish discharge of bile, resulting in irritation and eventual complete obstruction of the ducts, with cirrhosis of the liver as the final outcome. Fortunately this is a rare condition. It is occasionally seen in the first week of life, the child being jaundiced at birth. The skin is bright yellow, soon becoming greenish in hue. The urine is heavily charged with bile-pigments; the stools are light in color, and sometimes greenish mucus is voided with them. Hemorrhages from the umbilicus, bowels or stomach are apt to occur in connection with this type of jaundice, produced by extension of the ptomaines. Ordinarily it is the function of the liver to destroy these poisonous materials and render them innocuous; if the liver be disordered by congenital obliteration or by early catarrhal inflammatory obstruction of its ducts its function may be so interfered with that ptomaine-poisoning ensues with hemorrhagic results. Children suffering

this form of jaundice emaciate quickly, vitality is rapidly exhausted and death ensues from coma or other inflammatory diseases, as pneumonia, gastric catarrh or cerebral manifestations. The condition is a fatal one, congenital jaundice resulting in death in a few weeks or two or three months, jaundice having induced emaciation, even to a high grade of atrophy.

OMPHALITIC JAUNDICE.—This arises from inflammation of the umbilical vein, the result of navel infection. The stump of the cord is swollen and the navel ulcerated and inflamed, with hemorrhagic oozing or pus-exudation. An inflammatory zone around the umbilicus, and, in some cases, erysipelas ensue. Septic inflammation of the liver-tissue follows navel infection, the liver showing enlargement and tenderness, rare cases being attended by peritonitis. In this type of jaundice the discoloration follows promptly upon the inflammatory process; the infant is restless, cries a good deal and suffers pain, convulsions attending in a fair proportion of cases, sometimes ushering in the symptoms. Not only is the liver involved in the septic process but other organs may take on the metastatic inflammation, especially the brain and lungs, and in individual cases suppurative inflammation occurs. These cases are characterized by high fever, acute and rapid prostration, moderate discoloration of the skin, coma, convulsions and death. They are more fully described in the discussion of *Icterus Neonatorum*.

The icterus of the older years of child-life is almost invariably of the catarrhal variety. It may be seen in connection with typhoid or typhus fever, scarlet fever and blood-poisoning states, but these cases are more rare than the catarrhal variety of the disease incident to gastro-enteric disorders, and to the chilling of the portal circulation arising from cold.

Congestion of the Liver.—Catarrhal jaundice is preceded by congestion of the hepatic gland. In fact, acute congestion of this organ may occur without the condition going on to catarrhal inflammation of the liver. Children are especially subject to it from eating too heartily of rich foods, it here showing as an attack of acute dyspepsia attended by jaundice and liver pain. The jaundice is usually not intense nor is the pain severe. Vomiting is the most uniform symptom, and not until some slight discoloration of the gland, following upon an acute attack of vomiting from gourmandizing, is noticed will the condition be attributed to the liver. It is then found somewhat enlarged and tender, the veins are distended upon the skin, and for a brief period of time the stools will be light and pasty. The symptoms subside without the postrivity of manifestations that attend upon catarrhal jaundice.

A special form of hepatic congestion is seen in connection with chronic malarial infection in which the large glands of the body are all involved. It also belongs to diseases of the heart and

lungs and accompanies pneumonia and various cardiac diseases. The liver will be slightly swollen and tender, with mild manifestations of gastric catarrh and general dyspeptic symptoms, as nausea, loss of appetite, flatulence, furred tongue, foul breath, headache and slight symptoms of jaundice, though but for the discoloration of the urine and conjunctive attention might not be directed to the liver.

Treatment.—The treatment of acute congestive catarrhal inflammation and other acute types of jaundice is generally the same. The treatment of Icterus Neonatorum will be found in its respective chapter.

INDICATION.—Acute congestion of the liver arising from sudden exposure to cold or checking of perspiration will demand such congestive remedies as *Aconite* and *Ferrum phosphoricum*, especially. For the results of gormandizing *Nux vomica*, *China*, *Iris* and *Pulsatilla* are more likely to be needed. If dependent upon suppression of the acute exanthemata *Bryonia*, *Rhus tox.* and *Sulphur* will be more apt to be called for. *Mercurius* is another exceedingly useful remedy in congestion of the liver and hepatic torpor, especially in connection with malarial diseases. *Hydrastis*, *Polyphyllum*, *Sepia* and *Leptandra* are among the hepatic remedies that are especially useful in engorgement of this organ in child-life, while in the profounder disorganizations due to the severe infective fevers and altered blood-states, as yellow fever and pernicious intermittent, purpura and smallpox, *Arsenicum*, *Lachesis*, *Crotalus*, *Secale*, and *Carbo vegetabilis* may be demanded.

Commencing with acute congestion of the liver, usually ushered in by a chill or chilly sensations, tenderness of the organ, some fever, and headache, either *Aconite* or *Ferrum phosphoricum* will be demanded; the former, if the case is pronounced and due to exposure to sharp cold or to getting the feet wet. *Ferrum phosphoricum* is to be preferred if with these symptoms there is some nausea, loss of appetite, rise of temperature, and if there be not present the restlessness and thirst of *Aconite*. *Belladonna* is preferable to either if the congestion be sufficiently pronounced to give considerable pain in the hepatic region, with heat, headache, flushed face, and coldness of the hands and feet.

If the congestive stage is followed by inflammatory symptoms, with increase of temperature, headache, pain and commencing jaundice *Gelsemium* and *Bryonia* are apt to be needed. The *Bryonia* case has more nausea, pain upon moving, hepatic tenderness and constipation. *Gelsemium* is more likely to be required if there is freedom from nausea, increase of fever, moist skin, flushed face, little or no thirst and full, compressible pulse.

Ipecac may be called for if the vomiting is severe. This is not usually the case, but if the congestion of the liver depends upon gastric derangement either *Ipecac* or *Antimonium crudum*

may be needed. *Iris* and *Mercurius* may also be called for if the hepatic congestion is in connection with dyspepsia. Both these remedies are to be thought of in that type of the disorder supposing to be the phenomenon of "biliousness." *Iris* is especially useful where with the congestion there is nausea and headache combined, the sick headache of the gourmand with jaundice.

Mercurius will be given the preference if the tongue is heavily coated white and the imprints of the teeth show on its edges. The child is sluggish and its bowels are torpid. If old enough to express its taste it will complain that it is metallic or bitter, while the taste of *Iris* is more likely to be greasy. *Iris* has burning diarrhea, while with *Mercurius* the stools are gray and pasty, and symptoms of jaundice show early.

Nux vomica is especially indicated when hepatic congestion arises from the use of coffee in child-life or from rich pastries. There is constipation and headache, and the child is irritable, peevish and high-strung. The liver is swollen and sensitive to pressure. This remedy is especially to be thought of in connection with the abuse of domestic remedies.

Lepidra is called for when the stools are black and burning. Dull pain in the region of the liver, with drowsiness and tickly palms about the navel; jaundice shows early.

Natrum muraticum, *China* and *Arsenicum* are to be studied in connection with hepatic torpor as an accompaniment of malarial manifestations. The first named has the malarial cachexia; skin earthy and yellow. Obstinate constipation, liver swollen until it interferes with breathing; also causing palpitation. *China* has hard, swollen liver, eructations from the stomach, bitter taste, chilliness of the skin, debility, with periodicity in rise of temperature, and headache. *Arsenicum* presents burning pain in the right hypochondrium, stitches in the right side, vomiting of dark colored fluid, stools black; anxiousness, restlessness and itching of the skin, especially over the liver and abdomen, which is distended.

Chelidonium is better suited to chronic torpor of the liver with obstinate constipation. Stools hard and knotty, voided in small crumbly pieces from lack of moisture in the intestine. Liver pain in right shoulder blade with swelling and sensitiveness of the liver. Jaundice pronounced.

Hydrastis canadensis has long been used as a domestic remedy for liver derangements. It has very bitter taste, chronic torpor of the bowels, lack of appetite, heavily coated tongue, yellow at the base; urine saturated with bile-pigment; foal and scant stool and pronounced perspiration.

Phosphorus is more especially useful in pronounced jaundice from organic disease of the liver and secondary heart troubles. It is also beneficial in malignant jaundice from portal obstruction, and for engorgement of the gall bladder. There is loss of appe-

sive, unquenchable thirst, relaxation upon falling asleep, with profuse sweat during sleep, especially night-sweats. The liver is enlarged and sore to pressure. In emaciated children of waxy cachexia, with debility and enlargement of the liver, *Phosphorus* is of first importance.

Sesqu is useful in derangements of the liver in childhood, with sallow face, the characteristic yellow bridge across the nose and yellow streak under the eyes. Aching in the right side, forehead and conjunctivæ; stools bright yellow, or of an ashy color. Hepatic neuralgia, with stitches under the right ribs.

Besides the remedies named *Lycopodium*, *Sulphur*, *Natrum sulphuricum*, *Chrysanthum* and *Digitalis* may be studied to advantage in special cases.

For the acute manifestations of liver engorgement but few remedies will be required, while in chronic hepatitis an extensive range will have to be carefully studied in order to be able to select the simillimum.

DIET.—A matter of first importance in connection with diseases of the liver is diet. It must be remembered that the function of this organ is two-fold, the performance of the glycogenic function and its service as a scavenger for the blood, separating from it the debris that goes to make up the bile. The latter fluid is necessary to perfect intestinal digestion. It assists in the emulsification of fat, and by its irritating presence prompts the intestinal glands to greater activity. It promotes the digestion that has taken place in the stomach, and by its action on the chyme absorption is rendered more easy. If rich foods are taken into the stomach the work of the liver is correspondingly increased, hence the importance of a light diet or total abstinence for a few days during the presence of acute congestion of inflammatory disease of this gland. The glycogen secreted by the liver cells is converted into liver sugar and taken up by the blood by which it is carried to the muscles, there to be utilized and broken up into carbon dioxide and water, in which form it is eliminated from the body. It is this process of the manufacture of sugar in the liver that is called its glycogenic function; and with this knowledge of the physiology of the organ it is easy to comprehend the necessity for simplicity of diet and abstinence from all starchy foods and fats during bilious states. Objection obtains also to the free use of meats and eggs since they are rich in albumin, it being a part of the office of the bile to convert the proteids into soluble peptones in the intestinal tract.

Fruits, especially acid fruits, are permissible in hepatic disorders. If meats are used at all they should be administered in the form of peptonoids in order that both stomach and liver may be spared as much as possible from participation in the act of digestion. Milk should be used sparingly, if at all, when it tends to constipation,

as it frequently does. In fact but little diet will be necessary when congestion of the liver or acute inflammation of this organ is present, and in subjects of torpor of the liver there should be a free admixture of juices and succulent vegetables with a limited proportion of food rich in albumin and fat.

CHAPTER LX.

ABSCESS OF THE LIVER.

General Considerations—Symptoms and Course—Diagnosis—Treatment—Surgical Treatment—Medication

General Considerations.—Suppurative hepatitis is more commonly seen in hot countries, and depends as a rule for its causation upon the amebic variety of dysentery. It is not more common among children than adults, but is seen in child-life with sufficient frequency to make a knowledge of its causes, course and treatment important in connection therewith. It arises also from injuries to the liver, and is produced during the course of pyemia from embolism. It is also caused in children by parasites, especially the round worm, which may find its way into the liver structure via the bile-duct. In adult life a frequent cause of inflammation and suppuration of the hepatic gland is gall-stones, but these are not common to child-life, hence hepatic abscess due to this factor is not seen in children.

As more commonly witnessed in the Southern portion of the United States and tropical countries abscess depends upon or is associated with amebic dysentery. As a rule there will have been suppression of the dysentery from opium or astringent drugs prior to the development of inflammation and abscess of the liver. It is not absolutely necessary, however, that this shall have occurred, nor that the dysenteric features shall have been very pronounced. Just as amebic cause dysentery in the human system so also they occasionally cause hepatic abscess as a primary affection. In India and Panama it is often seen as an idiopathic disease. During an experience of many years in the South it was not my lot to meet with a case of abscess unassociated with dysentery. Where it occurs independently of dysentery its cause may be ascertained, if due to the amebic coli, by the discovery of them in the secretions from the bowels, even though the latter be slightly formed, in association with constitutional symptoms of hepatic abscess. Should the abscess be located near the surface and discharge externally, as it sometimes does, or should the discharge be

through the pleura by the lung and mouth, colonies of anæbæ may be found in the expectorated pus.

Injuries to the liver are not apt to occur in children, yet may result from accidents, as from severe falls. Where traumatism is the etiological factor the association of the injury and subsequent hepatic inflammation and abscess will be so direct that difficulty will not attend the diagnosis.

Abscesses resulting from pyæmia are produced by the lodgment of infection in the cells of the liver, which may reach that gland through the hepatic artery or by means of the internal vena cava and hepatic vein. Infection also occurs by means of the portal vein and is common to various ulcerative diseases of the intestinal tract as well as dysentery, appendicitis and pelvic abscesses. In these cases the abscesses are usually multiple and may occur simultaneously with abscess formation in other parts of the system, especially the lungs. They form a part of a general chain of pyæmic abscesses. Not only is the round worm occasionally the cause of abscess of the liver but echinococcus cysts occasionally cause suppuration in this organ.

The liver fluke is also responsible for this type of hepatic disease, though less commonly than the round worm. The liver fluke is a triangular worm about one-half inch wide and one inch long. It is rarely seen in the human body, but is common to sheep, deer and is sometimes found in cattle. When introduced into the human system it is by means of subaqueous vegetables, as water-cresses, or through the drinking of impure water. Very rarely a child is infected with this entozoon from impurity of its drinking water.

Abscesses of the liver vary in size from positively minute abscesses or those as large as a filbert or pullet's egg up to the size of an infant's head or larger. The largest I have ever met with is mentioned in the chapter on Dysentery as occurring in my own practice, in which a little more than four quarts of pus were removed. The largest I have known in child-life contained a little more than a pint of pus. In connection with pyæmia they are multiple, varying in size from very small to large solitary collections of pus. The right lobe of the liver is the site of the abscess in three-fourths of the cases. The pus contained in large ones is usually reddish-brown in color, resembling anchovy sauce. In other cases it is a creamy pus, somewhat thicker and more flaky than pus in muscular abscesses. In long standing cases the abscess-wall is thick and firm, nature seeming to have encysted it so as to protect herself against auto-infection. In three hundred cases noted by Waring five per cent. remained intact, sixteen per cent. were opened by operation, five per cent. opened into the right pleura, nine per cent. ruptured into the right lung, five per cent. ruptured into the peritoneum, three per cent. ruptured into

the colon, and some individual cases ruptured into the hepatic and bile vessels and gall-bladder. The author post-mortemmed a case that emptied one and a half quarts of pus into the peritoneum, and has seen three cases in which there were sharp pain and copious discharge of pus into the bowel without fatality resulting. I have also seen two cases in which the abscess burst through the pleura and lung and emptied per os, one case resulting fatally and one in indifferent recovery. In another instance adhesive inflammation occurred between the liver and abdominal wall, with discharge of pus and hepatic fistula near the median line. This case occurred in the practice of a Louisiana physician and its subsequent history is not known.

Symptoms and Course.—Hepatic abscesses occurring in association with dysentery are not always characterized by pronounced symptoms in the earlier stages of the cases. There may be moderate hepatic pain, small enlargement, some increase of fever, chilly sensations, and even a positive rigor, followed by a rise in temperature to 103° or 104° . These cases are so often associated with malarial conditions that it is not always easy to determine just when the liver symptoms set in. A rather characteristic symptom is profuse sweating whenever the patient falls asleep. There is a peculiar sweetness of the breath that is noticeable in some cases. The tongue is coated with a white, pasty coating. Anorexia is present in marked degree, and if the stools are changed in character at all they are apt to be grayish or white. The pain attendant upon abscess of the liver is generally referable to the shoulder, following the course of the phrenic nerve. It is sometimes sharp and crampy. The patient is more comfortable lying on his right side, or on his back and right shoulder. The enlargement of the liver is more marked in the right lobe, and may be differentiated from cancer by the fact that the abscess is generally on or near the upper surfaces, and the bulging is toward the thorax or right side, rather than downward into the abdominal cavity and right hypogastrium. If the abscess is small, not larger than a Tangerine orange, it is not so easy to determine its presence. Repeated aspirations have been made in the search for hepatic abscesses, the symptoms pointing so strongly to the position as to justify this procedure, before they have finally been discovered. If the abscess be a large one the bulging may be so prominent that there will be no difficulty in making the diagnosis, and if it be located just under the capsule on the anterior surface of the liver fluctuation may be distinctly felt over the abdominal surface.

The cachexia of hepatic abscess is not that of jaundice, unless the conditions be associated, which is rare. The color of the skin is more of a pale lemon-tinge than the saffron-hue, and instead of the sclerotics showing the icteric stain they are of pearl color and

the eyes are glassy and staring. The facial expression in pronounced cases is almost as characteristic as the ovarian facial expression when large tumors are present. Enlargement of the liver causes dyspepsia, and labored breathing results in continued perspiration about the head and chest.

Abscesses invade the lung by agglutination of the capsule, diaphragm and pleura. There will be sharp pain in the right lung, dullness over considerable area, tubular breathing, and more or less copious discharge of reddish-brown pus. It is not like the brick-dust sediment of pneumonia, nor are pneumonic symptoms present. It is surprising what quantities of pus from abscess of the liver may be thrown off through the lung without destroying life. As has been shown by Waring's figures, five per cent. of liver-abscesses empty through the lung, and clinically this is accounted the safest of nature's efforts toward the emptying of these abscesses. Peritonitis is oftener seen when they open below than is pneumonia or other lung disease following upon discharge into the thorax.

Abscesses of the liver occurring in connection with general pyæmia possess no special features distinct from pyæmic abscess elsewhere. If multiple abscesses exist in the liver, and especially if portal phlebitis is present, the liver is enlarged and tender, the enlargement being uniform and not showing superficial bulging as in the large solitary abscess of this gland. In addition to the irregular septic fever that belongs to the general constitutional state the complexion may be muddy, or that of icterus, and the diagnosis of pyæmic abscesses in the hepatic gland may be made by adding to the general pyæmic picture the symptoms of more or less of jaundice, with enlargement and tenderness of the organ. Generally the complication is exceedingly serious, but no more so than pyæmic abscesses of the kidney, lungs or spleen.

Diagnosis.—The greatest difficulty met with in diagnosing abscess of the liver lies in the resemblance of its symptoms, in cases in which the abscess or abscesses are small, to those of malarial fevers. Abscesses are more commonly seen in malarious districts and during the prevalence of malarial diseases. There is marked intermittency of chills, fever and sweats; the rigors are much like those of malaria, the constitutional symptoms being easily confounded with moderate ague or bilious-remittent fever. The combination of malarial manifestations and amoebic dysentery is often seen, and thus it may be difficult to fasten the illness upon the liver, with dysentery as a cause when the latter has been considered cured, and the malarial manifestations have been thought to be continuing. When the abscess is of considerable size the diagnosis is easy. Liver pain and tenderness, with some swelling of the organ, pain under and up to the right shoulder, and the characteristic sweats, occurring when falling asleep, are, together,

sufficiently diagnostic, especially if associated with previous history of dysentery, ulceration of the rectum, or severe hemorrhoidal engorgement, which is occasionally the cause of hepatic abscess through embolism.

Treatment.—There is little to be done in multiple abscess depending upon pyemia as a cause. This condition is rarely recognized until the general systemic poisoning is so complete that recovery is impossible. If pylo-phlebitis is pronounced a fatal issue is equally certain, inflammation of the portal vein being among the most certainly destructive of the pathological lesions of the liver. In both these conditions treatment will be limited to medicinal measures directed towards improvement in the general systemic state, with the exception that should a considerable-sized abscess of the liver present to the surface in association with pyemia the same surgical rules will apply that relate to solitary abscess from other cause.

SURGICAL TREATMENT.—The surgical treatment of hepatic abscess will consist of emptying it by means of a large aspirator needle, or by incision and drainage. In rare cases, especially in children, the abscess will point to the surface near the median line, after adhesive inflammation has taken place between the capsule of the liver and the abdominal wall. In these cases the treatment is simple, consisting of opening and cleansing the abscess cavity; this should be done under anesthesia and the incision be made carefully in order that the contents of the abscess be not allowed to escape in the abdominal cavity should the adhesion be incomplete. Standard works on surgery must be consulted with reference to the operative treatment of liver abscesses.

Medication.—Medical treatment will be directed toward the support of the system, the allaying of inflammation, and against prostration. If due to metastasis of amebic dysentery, and ushered in by a chill, fever and sweats, *China*, *Arsenicum*, *Gelsemium*, *Ferrum phosphoricum* and *Lachesis* are more likely to be required than other remedies.

If occurring idiopathically, with sudden onset, chill, intense headache, rigors and general inflammatory symptoms, the remedies suited to the condition are *Asafoetida*, *Ferrum phosphoricum* and *Veratrum viride*. Dr. Mark Andrews, of Waterproof, Louisiana, believes that *Silica* will avert hepatic abscess in many cases if given early. He some years ago cited a case of recovery under the use of this remedy when a fatal issue was expected. *Hepar*, *Artemisia* and *China* are equally indicated in the hectic condition belonging to liver abscess, *China* being useful when there is marked periodicity of the symptoms, with copious perspiration and great debility.

Arsenicum and *Lachesis* are both suited to cases assuming a typhoid state, the fever being more continuous with *Arsenicum* than

with *Ching*; the sweats are cold and some derangement of the stomach is seen, as nausea, vomiting, loss of appetite, foul breath and heavily coated tongue. The patient is restless and apprehensive, while disturbed breathing adds to the discomfort. The *Lapcheu* subject is sunken in a low typhoid state, with sores on the lips, teeth, tongue and throat; burning diarrhea completes the case.

Phosphorus is more especially useful in cases bursting through into the median line or emptying by the lung. The patient is cachectic, his extremities edematous, the heart's action is feeble, and there is present sharp, dry, teasing cough, which prevents sleep and causes pain and tenderness in the hepatic region.

Bryonia and *Nuxvomica* are especially applicable in cases characterized by pain under the right shoulder blade and extending to the joint. *Bryonia* is particularly useful when the liver is swollen and sensitive to pressure, the skin dusky and the patient constipated.

In a general way it is believed that better results are to be obtained in the treatment of liver abscess by the continued use of *Silica* and *Hepar sulphur*, persisted in faithfully over a considerable period of time, than by frequent change of remedies to meet symptomatic indications. *Artemisia* is also a basic remedy of value in cases occurring with chronic malarial infection, being also among the best remedies to be generally considered. In individual symptoms presenting throughout the course of abscess of liver a wide range will have to be covered in selecting the remedy.

CHAPTER LXI.

INTESTINAL PARASITES.

Oxyuris Vermicularis—Symptoms—*Ascaris Lumbricoides*—Symptoms—Treatment

Oxyuris Vermicularis.—Children are frequent sufferers from the presence of intestinal parasites. Of these there are a number of varieties, the most annoying of which in young infants is the thread worm or *oxyuris vermicularis*. These usually inhabit the lower portion of the bowel, especially the colon in the region of the flexures. They are also common to the rectum, and in female children frequently infest the vagina as well. They look like little pieces of chopped white thread, no larger in size than from a twelfth to a sixth of an inch in length. They are nearly white and are fusiform in shape, the female worms tapering to

a fine point, the males having a blunter and generally curved tail. (Fig. 50.) They are introduced into the system by food in which the ova are lodged. Besides the discharge of considerable quantities of



FIG. 50.—*Oxyuris vermicularis*, female. Highly magnified. (Quain's "Dictionary of Medicine.")

fully developed oxyurides large numbers of eggs are passed (Fig. 51)



FIG. 51.—Eggs of *Oxyuris vermicularis* including embryos $\times 400$ diam. (Quain's "Dictionary of Medicine.")

with the feces; in special cases the number of these parasites may be so great that the whole mucous surface of the colon and rectum seems to be coated with them. In children very much troubled with them they are often seen to escape from the anus in considerable numbers, even crawling about on the nates and vulva and in the folds of the groin. They are more commonly seen in weakly, anemic children whose general condition is unwholesome, and also in those children whose food is not of the best. They belong to children

in all walks of life and are frequently attendant upon dyspepsia from excess of starchy foods, candy and sweets.

SYMPTOMS.—It is not always possible to determine the presence of thread worms from the symptoms. These are so common to many conditions of the bowel, as infantile dyspepsia, subacute and chronic inflammation of the mucous lining, that the only conclusive settlement of the question is the presence of worms in the stool or about the anus. The symptoms commonly ascribed to thread worms are itching about the anus and vulva, itching of the nose, causing the child to pick at its nose almost constantly, grinding of the teeth, nightly terror, sudden crying out in sleep, involuntary twitching of the muscles of the face and jerking of the hands and arms, peevishness, debility, and recurrences of feverish attacks, even to typical worm fever. Vesical irritation, even to incontinence of the urine, with constant nightly wetting of the bed, or the reverse—retention of the urine with great vesical distension—are among the reflexes belonging to pin worms. The itching of the anus and vulva is sometimes very distressing, and the continued presence of numerous thread worms sets up sexual irritation resulting in early or eventual masturbation. They are more common in girl children by two to one, are quite prevalent in feeble children of cachectic habit, and especially common to orphan asylums and foundling institutions. Infection occurs by the lodgment of the ova in food or on the

toys of children, by clothes worn by different children in the same family or institution, and may be admitted to the system by means of food and drink.

Ascaris Lumbricoides.—Round worm is another variety of parasite that give great annoyance to children. This worm is from four to six inches in length in the male and from eight to ten inches in female varieties. It looks very much like the ordinary earth worm, is yellowish-white in color, and sufficiently tinted with red to be almost as pink as is the fish-worm. It is long, slender, and cylindrical in shape and tapers about equally at both ends. The posterior end of the male ascaris is more blunt and somewhat curved. It is also distinguished from the female worm by its shorter length and rather larger size. These worms are supplied with fine teeth between three lips at the anterior extremity. Earth-worms are rather redder in color and not so gently tapering as the bowel-worm, and have plainly marked segments. The ova of the ascaris is about one one-hundredth of a square inch in length and is passed in large quantities in the feces. They are much more common in children than in adults and are not often seen in early infancy. They belong in the small intestines, from which they often pass into the stomach and even into the esophagus and mouth. They travel downward into the large intestine also and are occasionally found hanging from the anus. I have drawn away a number from the same child, at different times, from five to ten inches in length. The ascaris is found in unusual locations in special cases. They have been taken from the posterior nares, have been coughed from the bronchi, have been known to pass into the biliary duct and to escape through perforations into the peritoneum. They accumulate in considerable masses in the intestines and are passed away in numbers in the evacuations after a brisk purge or with diarrhetic stools. The ova are produced in almost countless numbers and are very resistant to

external influences. The method of infection is supposed to be the mouth by means of foods, sweets, toys, etc., previously infected by the ova. Children creeping about the



FIG. 52.
Egg of *Ascaris lumbricoides*.



FIG. 53.
Egg of *Oxyuris vermicularis*.



FIG. 54.
Egg of *Trichocephalus dispar*.



FIG. 55.
Egg of *Ankylostomum duodenale*.

floors, who pick up things which are taken into the mouth that are impregnated with the ova of the lumbricoides are especially likely to be subjects of this annoying parasite. They are more common among children living in filthy quarters, of dirty habits, and partaking of foul food, and where cleanliness is not known in the household.

SYMPTOMS.—Round worms may exist in the alimentary tract in considerable numbers without their presence being known, the first indications of their existence being the discharge of the worms; but more often dyspeptic symptoms are present, and as a general thing the child is a sufferer from the chronic gastric catarrh of these parasites. There is loss of appetite, heartburn, alternation of diarrhœa and constipation—or there is a more regular habit of constipation—puffiness of the lids in the morning and dark circles under the eyes, itching of the nose and anus, and gulping-swallowing—a reflex symptom but occasionally caused by the presence of the worm in the œsophagus—are also seen. In occasional instances severe nerve disorders, as chorea and epilepsy, have been attributed to these parasites. Wormy children, if lymphatic, are disposed to sluggishness, with foul breath, indifferent appetite, constipation or diarrhœa of mucus, the skin being pale and waxy, and there being more or less nightly restlessness. Children of high nervous tension have more severe reflex manifestations, including nightly terrors, reflexes of the bladder, nervous twitchings and even a grade of worm fever and convulsions.

TREATMENT.—The treatment of oxyuris and ascaris lumbricoides may be conducted in one of two ways; either by the administration of vermifuges, followed by active purgation, with the thought of killing the parasites outright and causing them to be thrown off, or by constitutional treatment extending over a period of time with the thought of improving the condition of health of the alimentary tract, thus rendering it unsuited as a habitat. Those who favor the latter course hold, and with some justice, that worms are not found in children who have perfect health, and that to restore a perfect state of health means to institute an inability on the part of the parasites to find lodgment in the intestinal canal. As a rule wormy children are those who are not perfectly robust, or those whose diet has been at fault, so that a dyspeptic or subacute catarrhal condition has been established. On the other hand, worms are often found in children who to all appearances are enjoying robust health.

Of vermifuges none are better than *Santonin*. It kills the worm by its poisoning properties, and in mild doses is not harmful to the system. If administered to excess it may cause nervous manifestations, even to convulsions. In old school practice it is given in doses of from three to five grains, either with or immediately followed by a brisk laxative, since *Santonin* destroys the worm but does not throw it off. I have used it crude and in attenuations and have found that, as a rule, the second decimal potency in two grain doses, repeated every three or four hours for a day or two, will rid the system of these pests and not harm the child. It must be born in mind that if they are not purged away they may be digested in the intestine and not seen at all in the stool, the

only evidence of their destruction being relief of the symptoms they have been producing. If *Santonin* is given too strong or is continued too long it produces nervous manifestations and incontinence of urine. The urine will be a bright golden yellow if saturated with it. Patients who have taken it to excess contend that the humors of the eye are affected by it, with blue or yellow vision as a result. These symptoms are transient and of no consequence from a pathological view-point, but it is better to avoid them by giving moderate doses of the drug, if it be given at all. Another favorite with the old school, and in domestic practice, is turpentine, given in the form of emulsion. *Spigelia* with *Sassa* is another remedy, and the oil of *Chenopodium* is recommended as safe, and one of the leading vermifuges. I have administered it repeatedly without success. Where I find it desirable to use vermifuges I rarely go beyond *Santonin*.

For the reflex symptoms induced by the presence of worms a number of remedies are provided. Of all these the best is *Cina*. It has restless sleep, constant rubbing of the nose, grinding and gnashing of the teeth, cold and pale face, nausea and vomiting, vitiation of appetite, pain in the umbilical region, intense itching of the anus, persistent, trassing cough at night, sharp fever and high nerve tension, even to convulsions. The picture represented by *Cina* is almost a counterpart of the worm picture, and clinically this remedy has come to be all-sufficient in a large proportion of nervous disturbances from this cause.

Stannum has proven next best in the treatment of this disease, in my experience. The child has foul breath, heavily coated tongue, ravenous appetite, with nausea after eating; moaning and restlessness at night, with pale face and abject fear; it prefers to lie on its stomach to relieve the abdominal suffering; is dull and stupid with pale face and sunken eyes. *Cina* better suits the high nerve tension of wormy affections, while *Stannum* has sluggishness of disposition, general torpor, fetor of breath, flatus and passive fever. I have used it for a number of years in the third attenuation, every three hours for a week or more, and have had reports of the passing of prodigious quantities of thread worms and ascarides under its use.

Indigo is a remedy of value in convulsions resulting from intense pain in the umbilical region; convulsions commencing in the abdomen; very acute pains, with no distension of the abdomen, no disturbance of the appetite, but wormy diarrhoea of fecal matter with mucus and thread worms in the discharge.

Mercurius solubilis has given me excellent service in the symptoms arising from lumbricoides. Severe colicky pains in the central portion of the abdomen; fetid breath; increase of saliva, which is putrid; heavily coated tongue, the imprint of the teeth showing on its edges; child excessively hungry but not well nour-

ished; itching of the anus; convulsive choking; gulping as from worms in the esophagus; stools white and pasty, and in most cases reflex symptoms, sometimes with increased secretion from the salivary glands.

Terebinthina is much like *Cina* in that it suits the high nerve tension of wormy children. Burning and tingling at the anus; irritability, and weakness of the bowels; feeling of hunger and necessity for immediate relief; hunger even after eating a full meal; wakeful at night, screaming as if frightened, or with nightly terror; clenching of the fingers and twitching of the different parts of the body; waking suddenly with severe fright and going into immediate spasms, retention of the urine; sharp, scalding, burning urine.

Seseli is applicable to the wormy state in young girls with vaginal leucorrhœa from worms in the vagina. *Sabadilla* has vomiting of round worms, chilliness and sensitiveness to cold; accumulation of water in the mouth and sensation as if worms were in the throat. *Baryta muraticum* is suited to the dry cough, fetid breath, ravenous appetite, with shiny, coated tongue, and periodical attacks of convulsions, so radical as to involve the whole body, arising from worm affections. It has chronic, painless diarrhea with yellow slimy stools accompanied by vomiting. *Cinna* may be demanded for convulsions arising from worms. *Acacia* and *Ferrum phosphoricum* suit fever from this cause, and *Argentum nitricum*, *Lycopodium*, *Calcarea carbonica* or *Sulphur* may be demanded in the wormy state for the general condition of the child. *Kali muraticum* may be found beneficial in the affections caused by thread worms, and *Natrum phosphoricum* is highly recommended for the long, round intestinal worm, with pain in the bowels, restlessness, grinding of the teeth, itching of the anus, and other wormy symptoms.

Local injections of carbolic soap-suds or of a weak solution of carbolic acid are often necessary to destroy nests of pin worms in the rectum. In most cases the anal itching is reflex in character, but in others it is due to the presence of pin worms, which cause no inconsiderable distress and nervous symptoms, especially at night. Here some cleansing local application is very necessary. Thorough cleanliness of the lower orifices must be practiced and care should be taken that children who are sufferers from wormy manifestations shall have clean, wholesome, well-cooked food and pure water. Sweets, starchy foods and pastries go far toward the development of the conditions that lead to the presence of worms.

TENIA.



(11)

(12)

(13)

TENIA. FOR EXPLANATION SEE TEXT.

CHAPTER LXII.

TENIA.

General Considerations—Symptoms—Treatment

General Considerations.—There are various varieties of the tenia, or tape worm. They are seen not only in children but in adults, being more commonly met with in children who are fed on beef juices or rarely cooked meats. Four varieties are found in the human family, *tenia medicanellata*, or the beef worm, and the *tenia solium*, these two being the most commonly seen, the other varieties being the *tenia armata* and *tenia cucumaria*. Besides these

four species, the first two of which are the most common, there is a fifth known as the *bekrioccephalus latus*, which, however, is only found in certain remote portions of Europe and not seen in this country. The tape worm consists of a head, slender neck and a body. The head is oval, about the size of a pin head, and is provided with suckers, two to four in number, about equally distant on its upper surface (Fig. 56). The neck and body are formed in jointed pieces or segments. There may be several



FIG. 56.—Head and neck of *Tenia saginata*.

hundred of these or as many as a thousand or twelve hundred forming a single worm. Near the head they are long and slender, but as they fully mature they become quadrate and finally spread out until they are wider than long. New segments are produced from the neck so that the distal extremity is composed of the first formations. These segments are fastened into each other from above below; that is, a new segment grows into the older one and as the segments mature they are passed in single segments or in numbers, or are digested in the bowel. Each segment contains the generative apparatus of both sexes; each segment is also self-impregnating. The centre of the segment is occupied by the uterus, which forms an elongated cavity, with radiating branches occupied by eggs. The male element is made up of a chain of seminal vesicles which empty



FIG. 57.—*Tenia saginata*; segments two-thirds natural size.

into a seminal duct, opening at the uterine mouth. The tape worm is fastened to the mucous membrane by the suckers on its head, its long slender neck and segmented body (Fig. 35) lying loose in the intestine. It is supported by osmosis in the small intestine, the head being usually attached to the upper part of the jejunum, the balance of this tube and the ileum being occupied by the segmented body and neck. The *tenium solium* is generally found singly, while the beef worm is found in pairs or nests.

The figures given in connection with the ova of the tape worm are something marvelous. Each segment is said to contain as many



FIG. 35.

Segment of *Tenia solium*.



FIG. 36.

Segment of *Tenia saginata*.



FIG. 37.

Segment of *Bothriocephalus latens*.

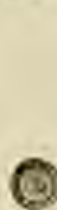


FIG. 41.

Egg of *Tenia solium*.



FIG. 42.

Egg of *Bothriocephalus*.

as fifty thousand eggs, so that a worm containing a thousand ripe segments has fifty million eggs. The tape worm may live in the human system for ten or fifteen years,

going with some people all through life. Individual segments are said to retain their vitality outside the body under favorable conditions for several years. There are about four hundred and fifty segments between the head and the first sexually mature segments of the body.

An immense quantity of ova are passed off by cattle and hogs in barnyards, and thus new infections of these animals by means of their food takes place, so that reproduction of these parasites is easy. They are taken into the stomach by food, the embryos piercing the stomach walls, to be carried along in the blood to the muscular tissues, which are subsequently eaten by man with the result that the tape worm is developed in his intestine. The larval cysts that develop in pork are a little larger than a pea, and in the beef somewhat smaller. These may remain quiescent for some years, after which they may appear calcified. If the eggs of tape worms should happen to be swallowed cysticerci may develop in various parts of the body, though they are rare specimens in the human family.



FIG. 43.

Tenia saginata.



FIG. 44.

Tenia armata.



FIG. 45.

Tenia lata.

The muscular structure of the animal body is a favorite site for the location of cysticerci, where they develop into spots called "measles." (Fig. 66.) These are developed in the course of three or four months to the size of a pea, when destructive inflammation may be set up or the larva may remain encysted and do no harm. The pork-worm is more likely to infest the food in its immature form than as a fully developed embryo of tape worm. When present in considerable numbers the animal in which they are lodged, and in whom they have usually been developed from infection through human feces, will show signs of distress, emaciation, falling of the bristles, stupor, convulsions, partial paralysis of the locomotor organs and general ill-health. The cysticerci are found most commonly in the tongue, diaphragm and pectoral muscles. They occupy the same sites in man, as well as the chest and neck



FIG. 66.—"Measles" in pork.

muscles, and will emigrate in the intra-muscular tissue and cause abscesses, in which they float. They are sometimes taken up by the lymph and blood currents and carried to various viscera, as the brain, lungs, liver and kidneys. They have been seen also in the eye, sometimes causing destruction of the globe.

Tape worm infects man in one of two ways. Its egg consists of a minute ovoid egg, in which is contained the head and commencing body. It is taken into the stomach in food, when its covering softens and the head is allowed to protrude much as the chick finds its way from the shell. The primitive hooklets attach to the mucous membrane of the intestine and the worm begins its further development. The other modus is by means of the cysticerci, though this is so rare in man as to be deserving of little attention. They are a common cause of illness in pigs, but in about eight thousand five hundred autopsies held by Kotencki cysticerci were found in the muscular tissue but nine times.

Symptoms.—The ordinary symptoms of tenia in man are limited to the bowel. Among these are loss of appetite, nausea, colicky pains, borborygmi, alternating diarrhea and constipation, heartburn, flatulence and general dyspeptic state. In some cases the dyspepsia is so severe that emaciation and general lassitude and debility ensue. Capriciousness of appetite exists, and formerly it was believed that the ravenous appetite of atrophic dyspepsia was due to the amount of food the worm used. It is now understood that this is a purely dyspeptic symptom and that as a matter of fact the nourishment demanded by the tenia is exceedingly small, not enough to affect the appetite of the subject in the least. Vomiting and choking are sometimes present in children, and exalted sensitiveness of the nerves is an attendant upon the presence of tenia, though not so much so as with ascarides and

thread worms. Dilation of the pupils, itching of the anus, palpitation of the heart and even convulsions may occur from this cause; but it has been my experience that the symptoms of tape worms are limited to those ordinarily belonging to dyspeptic states. In fact in most cases the only evidences of ill health in the tape worm subject is a moderate degree of dyspepsia, the discharge of segments being usually the first proof of its presence. Severe reflexes are present in individual cases, e. g., vertigo, temporary blindness, tinnitus aurium and headache. When seen about the clothing or in the stool the segments are flattened and oblong, clear white or pale yellow, and slightly mobile. They are usually admixed with mucus, and are discharged in considerable number of pieces. Occasionally the whole worm is thrown off under the influence of a brisk cathartic, taken without knowledge of its presence. Infection is caused by the handling of segments carelessly, the fingers becoming contaminated, and thus it is possible for the physician or parent to become the subject of tape worm from examination or by handling the segments passed from the child. The beef worm or *tenia medio canellata* is



FIG. 67. — Pork tape worm. Head with hooklets.

also called the *tenia saginata*, a more convenient name for it and the one by which it is commonly known in this country. It is identified by its greater thickness and breadth; the whole worm, especially the head, is darker from the presence of more pigment and is thicker. The pork worm goes also under the head of *tenia armata* or the armed worm. Its coronet consists of from twenty to thirty hooklets, situated on the anterior portion of the head like a rosette. (See Fig. 67.) Its segments number from seven hundred and fifty to eight hundred and twenty-five, while the *saginata* often number one thousand or more segments and may measure from ten to fourteen feet in length. Segments seen about the clothing, when broad and thick, are of the *saginata* most likely. If soaked in a shallow vessel in vinegar they become translucent and the uterus can be seen quite plainly, with branches in all directions, containing ova. In the *armata* or *tenia solium* these are but few in number. The *saginata* is introduced into the system by means of half cooked beef and raw meat juices, and is the common worm in this country, though



FIG. 68. — *Tenia solium*. Head and mature segment, enlarged (Beckley.)

the name *solum* is most often used. (Fig. 68.) The latter comes exclusively from raw or half-cooked pork. The *armata* or *solum*, while rarer, is much more likely to cause grave symptoms. If pork that is eaten is filled with the eggs these may be prematurely discharged into the alimentary canal so that they pierce the coats of the stomach or the intestines and develop cysticerci. This accident may also happen from the discharge of ova by the bowel, through connection and transmission of them from the anus to the mouth by the fingers. The reflexes from them produce itching of the anus and also of the nose and mouth, so that it is easy to understand systemic infection arising in this way. Segments may also be introduced in the stomach from the act of vomiting, and occasionally the tape worm may be ejected during severe and protracted emesis. Some children become languid and debilitated from the presence of tape worms, take on the cachexia peculiar to the presence intestinal parasites, and are rendered very miserable and unhappy. If segments are seen the diagnosis is clear; if not the child may drag along in a state of ill health for several months from no other cause than the existence of *tenia saginata* in the intestinal tract.

Treatment.—The treatment of tape worm resolves itself into the simple question of complete expulsion and avoidance of further infection. I believe it to be fallacious to teach that it is possible to rid the system of *tenia* and keep it rid by improving the general health of the child. The dyspepsia from which it suffers is more the result of the presence of the worm than suggestive of a previous bad state of health. This has been proven to my satisfaction time and again by the rapid improvement and complete recovery of children who have suffered dyspepsia and general ill health over a period of time from the appearance of tape worms, the cure being complete upon their expulsion. Failure attends many cases because the *teniaefuges* have not detached the head. The body and neck may be thrown off to the extent of several feet, embracing hundreds of segments, but if the head still be attached the worm may be reproduced. It occasionally happens that there is more than one worm present, a single one being destroyed by the action of the vermifuge, one or more heads remaining.

Constitutional treatment is demanded in most cases for the relief of symptoms which have been caused by the presence of *tenia*, but to my mind the only philosophical treatment of this variety of intestinal parasite is complete expulsion of the worm, to be followed by such constitutional treatment as the state of health of the infant may demand. I have seen complete expulsion follow upon the treatment of acute illnesses in child-life, but whether this occurred from the disease or from the remedies is an open question.

Of the teniafuges the best I have used is the male fern. This is given in the form of the ethereal extract, in doses of from one to two drachms in adults, from one-and-a-half to one drachm in child-life. It is not so safe in young children and youths as adults, and it is not certain of retention by the stomach. It may be given in gelatin capsules, or may be taken in milk or other menstruum; or it may be made up by a chemist in the form of an emulsion. It is very destructive to the tenia but will have to be followed by a brisk cathartic if we would make sure of having completely destroyed the worm by securing the discharge of the head.

The pomegranate root has long been a favorite domestic remedy and is recommended by some authors. Three ounces of the bark are macerated in twelve ounces of water for twelve or twenty-four hours; this is reduced to six ounces under the continued application of moderate heat, the whole quantity to be taken by an adult in broken doses, extending over a period of a day or two. For children two or three years of age one-fourth the quantity will suffice, doses for older children being in proportion. It causes nausea, vomiting and colicky pains but if prepared fresh is very effective. Pelletierine is the active alkaloid and its tannate is a satisfactory preparation. It is put up in bottles each containing an adult dose. It should be proportioned for a child according to age, about one-third of a vial for youngest subjects. I have used the tannate with some success but unless it is fresh it is inefficient.

Kemiss is another preparation quite extensively used in the form of an infusion but which has a disagreeable taste and, as with all teniafuges, is productive of vomiting in children.

Perhaps the most acceptable of all the preparations now in use for the destruction of the worm is the domestic pumpkin seed. It is the safest for children, and is also one of the most efficient. The seeds should be scalded and the outer shell removed, the soft portion of the seed being ground into a meal. This may be mixed with syrup or honey or other suited menstruum and given in ounce or two ounce doses, depending upon the age of the child. It is not usual that a child will eat of this mush unless starved to it, but if made to feel real hungry it may be spread on bread or on crackers, or given *en masse* as a mush, a little milk or cream mixed with it. It is well to follow it in the course of a couple of hours by a laxative, that the entire contents of the intestines may be passed away promptly so that examination for the head of the worm may be made.

In using teniafuges an essential part of the treatment is a period of previous starvation. All food should be withheld for from twelve to twenty-four hours; at least over night, and the selected medicine be given on an empty stomach. The effect of these remedies is unpleasant in other instances. Nausea and

vomiting usually occur; headache, dizziness and colicky pains attend upon the felix mass and pomegranate root, and sharp diarrhea is usually the result. But the idea is to get the worm. Passive measures at treatment are of little or no avail. It is clinically recorded that by continued treatment with constitutional remedies extending over a period of time in cachectic children, the discharge of the tenia is secured, but after having tried various methods over long periods of time I have had to return to pumpkin seed or felix mass as the most reliable treatment for this purpose.

Agave mexicana is reported by Parrington to be used successfully in Mexico for tape worm. *Cucurbita* or squash seed are used in the same manner as pumpkin seeds or may be given in infusion.

Kali carbonicum caused the discharge of a tape worm in my practice when given during a severe attack of pneumonia, but subsequent experiments with the drug directed toward tenia have proved unavailing.

Natrum phosphoricum, *Sulphur*, *Platinum*, *Calcarea*, *Ferrum phosphoricum* and *Sepia* are found useful in the constitutional condition present in the tape worm subject. *Sulphur* and *Sepia* have served me better than other remedies in clearing up cachectic symptoms. *Sulphur* especially is recommended for its possible vermifuge effects if given for a period of time. In such cases the constitutional condition improves and the worm may be thrown off.

NOTE.—EXPLANATION OF TENIA PLATE.

Peyer's Clinical Microscopy—Appleton.

PLATE

FIG. 1.

- (1). *Bethrioccephalus latens*.
- (2). *Tenia solium*.
- (3). *Tenia saginata*.

- (1, 1s). *Ascaris lumbricoides*.
- (2, 2s). *Oxyuris vermicularis*.
- (3, 3s). *Trichocephalus dispar*.
- (4, 4s). *Ancylostoma duodenale*.
- (5, 5s). *Trichina spiralis*.
- (6, 6s). *Distoma hepaticum*.

SECTION VI.

DISEASES OF THE HEART.

CHAPTER LXIII.

CONGENITAL DISORDERS OF THE HEART.

General Considerations—Foramen Ovale—Treatment—Valve Defects—Septum Defects—Contraction—Stenosis—Ductus Arteriosus—Aortic Stenosis—Valve Segments—Displacements—Malignities.

General Considerations.—The heart is often the subject of prenatal anomalies due either to defective intra-uterine nourishment or endocardial inflammation or to both. Anomalies may be classified for convenience of description as (a) those in which the conditions of the heart peculiar to the fetus in utero continue after birth, as patency of the foramen ovale, persistency of the embryonic valve and patency of the ductus arteriosus. (b) Anomalies of development such as imperfect septum, malposition of the ventricle or absence of the auricular septum, anomalies in the tissues of the arterial trunk, transpositions of large blood vessels, and alteration in the arrangement of the segments of the valves. (c) Deformities or deviations from the normal resultant upon endocarditis, as puckering, thickening, and adhesion to the valve segments or stenosis of the cardiac orifices. Baginsky's classification modified by Hurst covers, (a) patency of the foramen ovale, (b) defect of the ventricular septum, (c) anomalies of the right and left auriculo-ventricular orifices, (d) stenosis and atresia of the pulmonary artery, (e) presence of the ductus arteriosus, (f) stenosis of the aorta, (g) depression of the arterial trunk, (h) anomalies of the valve segments, (i) displacements of the heart.

Foramen Ovale.—(a) Giving attention to these conditions in order named the first to be considered is patency of the foramen ovale. It has long been supposed to be an important defect in the heart in children, but if unassociated with other abnormalities it is not likely to be a serious disorder. It is when the heart is involved in other abnormalities or conditions of disease by which the pressure in the right auricle is increased that the blood shows viti-

tion by direct passage from the right to the left auricle. If for any reason the septum between the auricle and ventricle is contracted so that the blood current is deflected from its ordinary course there will be admixture of blood in the aorta with cyanosis, carbonic-acid poisoning and death.

Patency of the foramen ovale may be due to abnormal development of the fossa ovalis, or it may arise from failure to accomplish perfect respiration at birth. The closure of this valve is co-incident with commencing respiration if the child be asphyxiated or the air cells collapsed so that extra labor is thrown upon the heart, the membrane fossi closing by adhesion, the opening remaining patent. The evidence of failure on the part of the foramen ovale to close at birth is cyanosis; and the more pronounced its conditions, the more the opening, the greater the danger to the infant. In special cases cyanosis comes on suddenly, when the child is doing apparently well from failure of the foramen to properly close at birth, or from re-opening of it. This is especially likely to be the case when the endocardium is affected. The so-called "blue disease" of infancy is oftener due to this defect than to any other single cause.

TREATMENT.—The cyanotic child should be kept perfectly warm and comfortable, as quiet as possible, and should always lie on its right side. Extra care should be taken to see that there is no shock to the nervous system or chill of the body, and in severe cases in which the child is very weak it will be better to nourish it for a few days by the spoon rather than to impose upon it the muscular effort of nursing.

Aconite, *Belladonna*, *Lachesis*, *Digitalis*, *Strophanthus*, *Cactus* and other remedies may be necessary in individual cases. Medication should be directed toward allaying unusual excitement of the circulatory organs, steadying the heart's action, and freeing the nervous system from the depressing effects of mixed blood. *Lachesis* is especially beneficial in this relation. If light spasms continue upon the post-natal closure of the valve a week or ten days after birth, as occasionally occurs, *Aconite* or *Belladonna* will be required.

During the active existence of cyanosis oxygen by inhalation will be found helpful. The end of the oxygen tube should be applied directly to the child's lips or over almost the entire face by a mask, the infant being unable to inhale with vigor.

Septum Defects.—(a) Defect of the ventricular septum is seen in association with other heart abnormalities. It is found most frequently in the anterior muscular portion of the septum. If an opening exists between the two ventricles there is propulsion of blood from the left to the right, taking the direction of the left ventricle. Complications are not apt to manifest themselves from this defect unless the right heart becomes thickened from its efforts

to dispose of the extra amount of blood thrown off with it, when oppressed respiration with cyanosis and transudation of serum into the connective tissues and cavities of the body occur. Cyanosis shows itself as a symptom of this defect but is not as acute as when the foramen ovale is involved, and is due to the separation of the circulation. The condition is recognized by a loud systolic murmur over the pericardial region and between the shoulders that is not transmitted to the blood vessels. The condition is a dangerous one, resulting unfavorably in the early months of childhood except in rare cases, where children may suffer for several years with their defective ventricular septum.

Valve Defects.—(*c*) The anomalies of the third classification consist of stenoses and valve defects of the right and left auriculo-ventricular orifices which are the result of endocarditis of the heart cavities occurring during intra-uterine life. They are more commonly found in the right valves than in the left. The tricuspid valve is thickened along with other portions of the endocardium, as the right ventricle is smaller than normal. If complete atresia of the orifices results the blood flows from the right to left auricle, and from the left ventricle in part into the right ventricle and thence into the pulmonary artery.

When the right ventricle is severely involved by stenosis the left ventricle is dilated and hypertrophied, and the right heart is similarly affected in case of associated stenosis and insufficiency, both systolic and diastolic murmurs being distinctly heard. The heart's action is labored, the cyanosis is pronounced and passive congestion that leads to hemorrhage upon slightest provocation exists.

Besides the abnormalities described there may be also imperfect separation of the cusps, leaving a circular opening between the auricle and ventricle, or there may be additional cusps.

Contraction.—(*d*) Left-sided endocarditis is the most frequent cause of abnormality of the left auriculo-ventricular orifice. If the orifice is considerably contracted the blood flows from the foramen ovale which is open into the right auricle, from there into the right ventricle and into the aorta via the ductus arteriosus. From non-use the left ventricle becomes atrophied to greater or less degree. Congestion of the lungs, extreme cyanosis, and death result upon impairment of the left ventricle and excessive admission of blood to the lungs.

Stenosis.—(*e*) Stenosis of the pulmonary artery is of the commoner defects of the heart. It is not necessarily fatal, many individuals going through life with impaired heart from dilation and hypertrophy of the heart muscles made necessary by stenosis. There is usually an infection or fungus endocarditis undergrowth in these cases, and the tenure of life is uncertain. If the hypertrophy is sufficient to compensate for the dilation and to admit of the extra

work the heart is compelled to perform patients who are possessed of contracted pulmonary arteries may go through child-life and youth fairly well; but the tendency to the development of tuberculous disease is more pronounced. The symptoms are cyanosis with imperfectness of the circulation and respiration. The surfaces are cold and the child is really unable to withstand the effects of cold or exposure. Sudden symptoms of trouble are those particularly caused from attacks of dyspnea, extreme cyanosis or lividity, and violent palpitation of the heart. A loud systolic murmur is heard over the second and third ribs, to the left of the sternum and the apex, and a thrill is imparted to the thoracic wall. The area of cardiac dullness is considerably increased and in later life the chest wall is considerably bulged anteriorly. Stenosis of the pulmonary artery is pronounced, also congenital endocarditis. The condition may be due to defective development with a wide opening between the auricles and pronounced atrophy of the right ventricle. The blood flows from the right auricle to the left with a portion of it passing to the lungs through the ductus arteriosus. If there is a defect in the ventricle-septum the aorta may rise from both ventricles, when the symptoms will be more pronounced—as intense cyanosis, and severe dyspnea followed by convulsions and death within a few hours after birth.

Besides stenosis of the pulmonary artery the coronal arteries is also cyanosed from faulty development with contraction of the lower portion and dilation about the contraction. The symptoms of this defect are about the same as those of stenosis of the pulmonary orifice; in fact it is quite difficult to differentiate the symptoms one from another, and since a large per cent of cases that are seriously affected result fatally early in life close differentiation is not always necessary.

Ductus Arteriosus.—(f) The duct closes in from fourteen to twenty-eight days after birth by an over-growth of cells in its inner wall. Persistence of the duct occurs in consequence of puerperal infection of the child, from certain cardiac defects, and as the result of faulty respiration and anomalous circulation in the lung. The duct remains open, in many instances, for several months, though closed to that degree that the circulation of blood through it is not possible. In cases in which it remains patent the clinical symptoms are hypertrophy and dilation of the right ventricle, dilation of the pulmonary artery, increase in area of the cardiac systolic murmurs, protrusion of the upper part of the sternum, attacks of suffocation and cyanosis, and a disposition to bronchitis and congestion of the lungs. Individuals who pass safely through child-life with this defect are apt to develop an atheromatous condition of the pulmonary artery. In a general way the prognosis is unfavorable.

Aortic Stenosis.—(*g*) Stenosis of the aorta is a result of defect or of endocardial inflammation. Stenosis is exceedingly rare, while atresia is an exceedingly rare condition. It is a much more serious condition than atresia of the pulmonary opening, resulting fatally in most instances in the first two or three weeks of life. If the one occur at the division of the ductus arteriosus the blood current may pass through the subclavian arteries, which become dilated, anastomosing with the intercostal and epigastric arteries. The arteries of the upper part of the body are much fuller and larger than those of the lower portion and the extremities. This is not a fatal condition, patients living to advanced years with defective aortic, and with compensation on the part of their arterial trunks.

Transposition of the arterial trunks is generally associated with serious defects that lead to early death. The blood flows from the right auricle to the right ventricle and is distributed from this ventricle back to the body, while the arterial blood from the left auricle is carried back into the lung. When this defect is observed it is absolutely impossible for the infant to live unless the foramen ovale remain open or there be communication between the pulmonary veins and the right side of the heart. Children whose circulations are thus rendered abnormal are cyanotic and subjects of dyspnea, are prone to hemorrhage, rapid cooling of the skin and extremities. They are apathetic, and rarely live beyond a few months.

Valve Segments.—(*h*) The number of valve segments may be diminished as a result of endocarditis, or by failure of development. It is of no special consequence unless seen in association with other defects. Extra valves have been seen up to five in number.

Displacements.—(*i*) Displacements are the result of deformities of the sternum and thorax, especially with congenital fissure of the anterior wall of the body. Other irregularities may crowd the heart well into the neck or downward into the abdominal cavity. Special rare congenital malformations are double-heart, atrophied apex, ill development of the heart, and, exceedingly rarely, complete absence of the heart, the intra-uterine circulation having been carried on through abnormally shaped large vessels.

Symptoms and Treatment.—For clinical purposes it is generally enough to know in the earlier days or weeks of infancy that the child is the subject of heart abnormality of some character. The symptoms of all the defects described are, in the main, alike, as cyanosis, dyspnea, general debility and in most cases early death. The cyanosis of pneumonia, asphyxia, pulmonary atelectasis, malformation of the respiratory tract; interferences with the normal respiration through injury to the nervous system and from other causes has been confused with the cyanosis of congenital

heart defects and diseases. The murmurs that have been discussed under the various headings given will assist in determining the heart to be at fault.

The treatment will in the main be hygienic and supportive. The child must be kept perfectly warm and comfortable, and spared the necessity of physical exertion, even the act of nursing. The ventilation of the sleeping apartment should be perfect; the child should not be allowed to lie upon its back, nor, as a rule, upon its left side. The administration of oxygen is, in a general way, justifiable in cases of cyanosis, no matter what its origin, especially so in child-life and in heart defects. The free administration of oxygen is objectionable, however, it being better to administer it with atmospheric air and not give it as nascent oxygen.

MEUCATION.—Remedies that will be found useful are those named in connection with the patency of the foramen ovale. Constitutional remedies as *Sulphur*, *Calcarea*, *Kali carbonicum*, *Silicia*, *Calcarea phosphorica*, *Arsenicum* and others may be required for constitutional debility and individual diatheses.

The diet should be supporting and nourishing, and during the earlier years of child-life it may be desirable while feeding the infant by the spoon to resort to rectal feeding to assist in tiding over the critical period. Inunctions of hot olive oil are also beneficial. Heart defects are not usually amenable to medication and if they depend upon endocardial inflammation the rheumatic remedies may be required, as *Rhus tox.*, *Bryonia*, *Colchicum*, *Kalmia latifolia*, *Kali carbonicum* and others of the rheumatic class.

CHAPTER LXIV.

ENDOCARDITIS.

General Considerations—Etiology—Symptoms and Course—Physical Signs—Diagnosis—Prognosis.

General Considerations.—Endocarditis, or inflammation of the membranous lining of the heart, is presumably due to infection, though sometimes it is not possible to trace it to a specific cause. It is seen very often during child-life, and in the fetus inflammation, especially of the right side of the heart, is known to occur. The morbid changes that take place in endocarditis are largely limited to the valves and cordæ tendineæ, but in some instances the inner lining of the heart is involved in the inflammatory process. The fibrous tissues of the valves are so severely involved in some cases as to be simply bands of serous membrane bound together by firm

fibrinous adhesions. The smooth serous membrane becomes opaque, thickened and roughened because of the changes in nutrition and infiltration of small round cells. The whole valves become thick and stiff, and the motions of the valves and cord cause deposit of the fibrin of the blood in the form of warty growths or excrescences, looking not unlike cauliflower excrescences. These sometimes undergo absorption and decay. In other cases contraction, puckering and distension of the valves occur, the cords are shortened, and narrowing of the valvular openings follow. In other instances particles of these vegetations are dislodged from the valves and are carried by the blood into the brain, lungs, spleen, kidneys, or other organs, to lodge as infarcts, there to cause serious trouble. Death of these vegetations occur in some instances, and the tissue crumbles and leaves an ulcerative surface, constituting the variety known as diphtheritic or ulcerative endocarditis.

Etiology.—Endocarditis may occur as a primary affection, but it is so often seen in association with other acute diseases that it is now generally accepted that by far the greater proportion of cases, in fact nearly all, are secondary manifestations. It is seen most often in the course of diseases produced by micro-organisms, presumably as a sequel thereto. Rheumatism causes more cases of endocardial inflammation than any other single disease, and while not a common ailment in young children yet in endocarditis without other appreciable cause it is generally safe to argue that the subject has suffered from rheumatism, whether it has been recognized or not. The simplest attack of rheumatism may be accompanied by endocarditis, even to simple inflammatory affections of the smaller joints or simple muscular rheumatism. It has been estimated by competent observers that at least eighty per cent. of cases of endocarditis depend upon rheumatism. Rheumatism in the mother during her pregnancy produces endocarditis in the fetus. If the disease occurs in association with chorea it is believed that the rheumatic nature of chorea is responsible for the presence of the heart ailment. Scarlet fever, small pox, dysentery, diphtheria, measles, erysipelas, pneumonia, pleurisy and septicemia are also responsible for endocarditis in child-life. My experience leads me to believe that it is more often resultant upon scarlet fever and the kidney lesions that follow than upon any other single cause excepting rheumatism, and doubtless it is the rheumatic complication of scarlet fever that is the important factor in most cases of endocarditis seen in association with that exanthem.

Micro-organisms are not often seen in the simple form of endocarditis, while in the malignant variety they are plentiful. The diplococcus of pneumonia, the streptococcus and staphylococcus have been seen in connection with this disease, but whether

as its cause or as a result of the processes going on within is not yet fully determined. Even mumps and tonsillitis may produce endocarditis, and especially is it likely to be seen in association with rheumatism that so often follows upon inflammation of the tonsils. Typhoid fever is also responsible for it, it following severe cases in child-life; and the simple septic states, as furuncles, *omphala*, styes, superficial abscesses, and various infective skin ailments may be responsible for individual cases of endocardial inflammation.

Physical Signs.—Endocarditis may run its course without developing abnormal physical signs. When a murmur is present it is soft, systolic and blowing, and generally heard only at the apex. It may be transmitted to the right side, and later may be heard from behind; but even here it is much more audible at the apex. The action of the heart is considerably increased, even to an excited action; the area of impulse is enlarged and the apex may be dislocated to the right or left. Its murmur is sometimes preceded for a few days by a roughness and muffled sound, with prolongation of the first heart sound. Should diastolic murmurs be heard they are especially significant. Reduplication of the second sound is sometimes heard at the apex in children, probably due to a lack of harmony in the action of the mitral and tricuspid valves as a result of thickening and contraction of the former. Aortic murmurs are occasionally heard but rarely in uncomplicated endocarditis, and are usually connected with the characteristic mitral murmur. The murmur of recent cases of endocarditis is soft and of a blowing character, while that of more confirmed cases is harsh and rough, and in some cases musical.

Symptoms and Course.—Endocarditis may set in during an acute attack of rheumatism, or it may occur so insidiously that its origin may not be known at all. Its symptoms are not plentiful nor sharply defined. Patients experience sensations of distress in the cardiac region and show considerable disturbance of the heart's action and pulse in rheumatism and other diseases without endocardial development; but if pain occur in the region of the heart, even though it amount to but a sensation of discomfort, distension and heaviness, but persistent, or if pain be acute and result in considerable interference with respiration, with local cyanosis, no matter how slight, and unusual pulsation of the veins of the neck, the physician should observe carefully the condition of the heart and be on guard for endocarditis. If the inflammation commence during an attack of rheumatism there is very likely to be an increase of temperature and other evidences of slight fever. In cases in which pronounced fever is not present, with intensifying of the febrile symptoms in cases in which it is already a symptom the heart's action is more or less torpid and the pulse becomes

rapid and irritable. There is a peculiar restlessness and expression of anxiety and discomfort, and in most cases slight evidences of cyanosis or capillary stasis are observable.

So insidious is the onset of endocarditis that in many cases it is necessary to take the temperature three or four times a day during arthritic inflammation in order to detect the slightest degree of elevation. There will usually be an increase of from half a degree to a degree or more in cases in which the superficial manifestations of fever are absent. If the muscular tissues of the heart are involved in the inflammatory process palpitation, considerable precordial distress, more pronounced cyanosis, and acute dyspnea will be present. The pain is intense when the heart muscle is involved, while in endocarditis uncomplicated by myocarditis the sensation is more that of anxiety and distress than pain.

As endocarditis develops the heart becomes easily excitable. The pulse is already rapid and its stroke sharply acute, and with efforts at motion, as turning in bed, assuming the upright posture, and also from emotions, the heart's action becomes further disturbed, the pulse quicker, and perhaps somewhat irregular, and auscultation shows the heart to be palpitating and fluttering very rapidly and irregularly. The patient is easily chilled, the hands and feet are more or less cold, the skin shows the peculiar goose-flesh appearance, and the patient is disposed to be more or less tremulous and nervous. The apex stroke against the chest wall is more positive than normal and the area of impulse is considerably increased. Whenever this class of symptoms is seen in the course of rheumatism, moderate pneumonia, or other simple infective process, it may be well understood that the heart is suffering partial or complete inflammation of the endocardium.

Septic endocarditis is generally ushered in with a series of shivering sensations, or even a sharply defined chill, and severe pains in the bones and joints. Loss of appetite, mental hebetude, and considerable physical prostration attend upon this form. If strictly septic in character the inflammation will be attended by repeated irregular chills and profuse sweats. The chill, fever, and sweat are presumed to be due to metastasis from septic processes, and may not be wholly associated with the heart involvement. This type of endocarditis is sometimes mistaken by the careless observer for a malarial complication of rheumatism.

The typhoid type shows itself by sepor, muttering delirium, and general typhoid symptoms, as dryness of the tongue, nodes on the teeth, enlargement of the spleen, roseola, and even diarræa, the surface indications being those of a mild form of typhoid fever. But instead of the characteristic stair-step temperature of genuine typhoid the fever of typhoid endocarditis is maintained at a maximum for a considerable period of time. The condition is to be distinguished by careful examination of the heart. If

ulcerative endocarditis is present there will be pronounced irregularities of the pulse and heart's action, palpitation, dyspnea, and especially severe prostration. The typhoid type of cardiac inflammation presents a picture so nearly like that of typhoid fever that it is difficult of differentiation in unusual cases; but it should be borne in mind that typhoid fever is a primary disease while typhoid endocarditis is invariably a secondary process. It is more likely to be seen in severe cases of typhoid fever, small pox, diphtheria, scarlet fever and pneumonia, and is doubtless the real condition in many cases that are carelessly announced to have been lost from "heart failure" due to a protracted course in either of these diseases. Especially if the patient's sensibilities are benumbed by the primary diseases the heart may be overlooked, and the irregularities of the heart's action, that even a careless observer will certainly notice, may be looked upon as neurotic.

The characteristic heart symptoms in endocarditis are the weakness of its action, and the certain tendency to unusual rapidity and irregularity, from either physical or emotional exertion.

Septic endocarditis often runs its course without the development of metastases; but in other cases the vegetations are dislodged and swept in the blood currents to lodge as infarcts in almost any tissue of the body. If emboli are lodged in the brain suppurative meningitis may follow, with thrombus and brain paralysis. The hearing may be destroyed, or defect of vision, even to absolute blindness, may occur from hemorrhages of the ear or eye. Hemorrhagic petechia show upon the skin, about the mouth and in the conjunctiva. Swelling and pain in the joints are seen, and the spleen is nearly always swollen. Hematuria, and albuminuria follow upon acute kidney infarcts, and if occlusion of intestinal vessels occurs there may be gastralgia, diarrhea, and even peritonitis. If infarcts lodge in the lungs there may be bronchial catarrh, hemorrhage, pleurisy, edema, and often septic pneumonia. In other words, general sepsis may result upon septic inflammation of the pericardium, and this inflammation be but a stepping stone between the primary disease exciting it and general systemic septicemia.

Chronic septicemia follows upon acute inflammation and upon recurring cases of agonic inflammation, although the prognosis is so grave in the latter that recovery from it is rare. The tissues of the valves become indurated and thickened in chronic endocarditis, and nodules form along the upper edges and about the corpora Arantii. Individual segments of valves are sometimes agglutinated to the sides of the heart or vessels, and in other cases they become wedged together by fibrinous deposit. When they are very much thickened or altered in structure the valves fail to close perfectly and regurgitation is sure to result, this leading finally to

obstruction and cyanosis. Chronic heart disease is, more strictly speaking, an affection of later life but is met with also in children who have had fetal endocarditis, or in whom it is developed in the first years of child-life. Young subjects are much more apt to overcome the condition that are seen in endocarditis, and sclerosis of the valves is less likely to occur, than in the endocarditic inflammation that occurs in adult life. The diagnosis is easy and will depend upon regurgitation and the various valve sounds.

The mitral valve is affected in the larger proportion of cases. Instead of being propelled into the aorta part of the blood regurgitates and finds its way into the left auricle, which consequently becomes distended. The auricle undergoes partial hypertrophy but remains thin, nevertheless, and because of the regurgitation is never completely emptied; the pulmonary artery is overfilled in consequence of the distension of the capillaries of the lungs, this resulting in a sharper sound of the pulmonary valve. The right ventricle undergoes severe hypertrophy, extending beyond the right border of the sternum. The sounds which distinguish mitral regurgitation are dilation of the left auricle, recognized by dullness upon percussion at the second rib to the left of the sternum; by distension of the pulmonary artery and increase in the pulmonary valve-sound, heard to the left of the sternum below the second and third ribs; by enlarged area of dullness because of the increase in the diameter of the heart extending to the right border of the sternum; heart bruit synchronous with faint sound of the heart heard most plainly at the apex; displacement of the apex to the left, beyond the mammary lines.

Stenosis of the mitral valve occurs in consequence of the contraction or sclerosis of the tissues involved, and the blood that comes from the pulmonary thickens and accumulates in the left auricle, finding its way by gravity into the left ventricle, only a portion passing out through the normal opening. The bruit that is heard is presystolic, and at the height of the disease there is heard from the base of the heart a double click or split second sound, due to the delay in the closure of the pulmonary valves from the resistance that is offered in the pulmonary artery to the blood column. The right ventricle hypertrophies as the heart muscles give way under the greater pressure which results, and the lesion becomes more serious and ends fatally in four or five days.

Other conditions of the heart that ensue upon endocarditis and that show themselves much more frequently in later life are not deserving of extensive description in this volume, as aortic insufficiency, stenosis of the aorta and insufficiency of the tricuspid valves. Tricuspid stenosis, pulmonary regurgitation and pulmonary stenosis are joint defects. The first named is exceedingly rare, and is shown by a presystolic murmur most intense at the ensiform cartilage, with extreme dilation of the right auricle, and

stasis of the whole venous system. Pulmonary stenosis has already been described among the congenital defects coinciding with a patent foramen ovale and other defects or abnormalities. It is shown by extreme cyanosis, attacks of vertigo and dyspnea, sharp heart beat, cyanosis, with a systolic murmur and hypertrophy and dilation of the right auricle.

Prognosis.—The prognosis of endocarditis varies according to the character of the inflammation and the disease with which it is associated. The simple variety or primary attack of endocardial inflammation is rarely fatal. It may be entirely cured, or so nearly so that no lesion or murmur will result, and no more symptoms or disturbances follow upon the process. More often, however, the valves are somewhat impaired and the pulse shows irregularity, capillary stasis is seen, the child grows anemic and recurring attacks of endocarditis ensue, with eventual severe impairment of the valves and disturbance of the circulation, with insufficiency, cyanosis, sclerosis and, finally, death. Other cases occur in which endocarditis is recognized as having been present in child-life only in later years. Confirmed valvular lesions and endocardial thickening have been found post-mortem without heart symptoms having been complained of at any time during life. No special significance attaches to the murmurs of endocarditis when it occurs as an acute ailment in children. These often disappear altogether. The important symptoms, as having influence upon the prognosis, are the degree of excitability and irregularity of heart action with associated dyspnea and cyanosis. The more easily the heart is disturbed and the more violently, upon moderate exertion or mental emotions, the greater the necessity for care in forming a prognosis. Endocarditis is far less fatal in child life than in adult life. In advanced years the prognosis is always grave when the heart becomes involved in acute rheumatism, whereas it is nearly always involved in children in rheumatic states, and this occurs also in association with other diseases with complete recovery, the full tenure of life being enjoyed.

Usually severe cases of primary inflammation are dangerous. Necessity exists for the greatest possible care in children suffering acute exanthemata and acute rheumatism that the heart be protected if possible from inflammatory complications. Septic endocarditis is an extremely grave complication, resulting fatally in by far the large majority of cases. As a rule it follows upon other septic states and thus becomes the last straw of a severe illness. Recovery may ensue, even after the case has gone on to ulceration; but this result is rare in this type of heart disease.

Conditions which may follow upon either simple endocarditis or the septic form are embolism of the brain, with hemiplegia and septic processes in various organs of the body due to endocardial infarcts. When the immediate dangers of acute or septic

endocarditis are passed it becomes very necessary to continue heart treatment and general constitutional measures over a long period of time, with reference to the prevention or modification of serious secondary states. Sclerosis is the natural result of severe endocardial inflammation, but proper homeopathic medication, carefully applied over months, or years if necessary, should overcome in great measure, and in individual cases completely cure, the sclerotic changes that are going on.

The treatment of endocarditis will be given in Chapter LXVI.

CHAPTER LXV.

PERICARDITIS.

General Considerations—Varieties—Diagnosis—Effusion—Prognosis—Treatment.

General Considerations.—As the name implies, pericarditis is an inflammation of the pericardium, the outer covering, or sac, of the heart. It is the result of an infective process in many instances, either primary or secondary, and in other cases arises from an extension of inflammation from contiguous tissues, as from the mediastinum or pleura. It is seen very often in child-life but not so commonly met with as endocarditis. It is most often seen in association with rheumatism, either as an acute or sub-acute affection. Primary idiopathic inflammation of the pericardium is exceedingly rare but is occasionally seen. It may occur from injuries, as severe traumatism, or the passage of a foreign body through the esophagus into this tissue, but is so commonly associated with rheumatism as to justify the suggestion that a rheumatic history is the basis in almost every instance in which it does not arise from an extension of inflammation from pneumonia or pleurisy. Suppurative pericarditis occurs in connection with empyema and is possible as a sequel to various infectious diseases, especially scarlet fever and small pox. Children under five years of age are not commonly the subjects of rheumatism, and pericarditis seen in more tender years of child-life is most apt to have as its causative factor either pneumonia or pleurisy or an infectious disease, while above five or six years of age it is more commonly attributable to rheumatism. When occurring during an attack of scarlet fever, or immediately following, it may be associated with inflammation of the synovia or the finger joints, and also be connected with post-scarlatinal nephritis. It occurs during septicæmic states no matter what their cause, whether from a simple osteitis or periostitis in children or the severest types of zymotic diseases. Pericarditis is not always seen in connection

with rheumatism during the height of that disease, but may occur when its symptoms have subsided and the patient is apparently convalescent, cropping up when least expected.

In the order of frequency pericardial inflammation is seen in association with or dependent upon rheumatism, sepsis, tuberculosis, eruptive fevers and various dyscrasie, as in subjects of the rachitic habit and those who are predisposed to kidney ailments. It is observed, too, in association with scurvy and diabetes, but it is an open question as to whether it is due to sepsis in these states or is directly an associate of the disease-process that is going on in the system.

Pericarditis occurs in varying degrees of intensity, from the mildest to the most severe, the former being characterized by perhaps such mild manifestations that the patient's attention will hardly be attracted to the fact that he is suffering from inconvenience or disturbance of the heart function, while in the latter the most violent attacks of angina may come on unexpectedly and as severely acute as the most pronounced case of pleurisy.

Among the septic states that induce pericardial inflammation are the sepsis of diphtheria, scarlet fever, typhoid fever, omphalitis, erysipelas, dysentery, periostitis and general systemic septice-mia, with furuncles and local abscesses of the connective tissue, or metastatic abscess-formation in almost every organ of the body.

Inflammation of the pericardium is seen in all ages, from earliest infancy to old age. Cases are reported by Billard, Bedner and others in which it seems to have occurred during fetal-life. In early infancy it is associated with omphalitis; as the child advances in months and years it may occur in connection with almost any acute disease.

Varieties.—Osler considers pericarditis under the anatomical and clinical division of (a) acute plastic or dry pericarditis; (b) pericarditis with effusion, sero-fibrinous, hemorrhagic or purulent; (c) chronic adhesive pericarditis.

The first named is the most common form and occurs usually as a secondary process. The entire pericardium may be involved in the inflammation or it may be partial. In mild forms the membrane is slightly roughened, due to the presence of a thin, fibrinous sheeting, separable from the membrane, the latter showing injection and ecchymosis where the film has been attached. If the fibrinous exudation has been considerable the fibrin is seen in long shreds, giving to the membrane a shaggy appearance. It is this form of exudation that was formerly described by authors on heart disease as the "hairy heart." The muscle underneath the pericardium is usually not involved in the inflammatory process, but may be more or less turbid; and if the condition is dependent upon tuberculosis layers of lymph and granulations are to be seen upon careful inspection of the membrane. There is nearly always

more or less serous effusion present in even the simple forms of pericarditis.

Diagnosis.—Acute plastic pericarditis is distinguished by the friction sounds, which are not likely to be mistaken for other heart sounds. It is possible to confuse them with the double murmur that belongs to incompetency of the aortic valves; but it should be borne in mind that these are present always, whereas, the friction sounds of pericarditis belong to an acute inflammatory process, present only for a limited length of time. The friction sound is so sharply defined that there need be no confusion with the softer murmurs of inflammation of endocarditis. The friction that occurs in pleuro-pericardial inflammation is common also to endocarditis, phthisis pulmonalis and pleural pneumonia. It is to be heard over the left border of the heart. In rhythm it is not the simple diastolic and systolic murmur, but is intensified by the respiratory rhythm, the murmur being increased during expiration and lessened during inspiration. It is not likely that the pericardial friction sound will be confused with the metallic click of phthisis pulmonalis, the general constitutional state of the patient in the latter disease assisting in making the diagnosis clear. Inspection is not likely to assist in the diagnosis of pericarditis, but palpation occasionally reveals a distinct fremitus, especially when the pericardial surface is very much roughened. It is only when the case is pronounced that fremitus is imparted to the hand, and then only over the right ventricular region. The friction sound that is heard upon auscultation is double, corresponding to the diastole and systole. The sound has a peculiar rubbing, gritty, grating quality, and is positively harsh in comparison with the endocardial murmur. It is best heard over the right ventricle between the fourth and fifth interspaces. Occasionally it is heard better at the apex and it may be limited and heard over a very narrow area, as is likely to be the case if the inflammation is partial; or it may be heard quite distinctly over the whole cardiac area and the sound transmitted up and down the sternum in severer cases. It is a peculiar feature of acute plastic pericarditis that the sound is not uniformly present. It may be very pronounced in special cases and in others be quite absent. In some it is a soft rubbing or creaking; in others it is loud enough to obscure the normal cardiac sounds. Endocardial murmurs may be heard simultaneous with those of pericarditis, but the latter are nearer the chest wall and more audible and the two should not be mistaken. Endocardial murmurs are more blowing in character, while those of pericarditis are more as if surfaces were being rubbed together, the fibrous friction sound of this disease that should not be confused with deeper murmurs.

Effusion.—Effusion occurs in pericarditis in children, and the disease may come on so insidiously after a week or two of failing

health, slight fever, shortness of breath and precordial distress that the heart condition may not be noticeable until the effusion has become quite extensive. This is especially apt to be the condition when effusion is due to tuberculosis, as it is also in association with scarlet fever, the heart symptoms which are manifested as the case progresses being attributable to the constitutional state of the patient in tuberculosis and to the irritation of the toxæmia and the exanthem when scarlet fever is responsible. The quantity of effusion varies from an ounce to a pint or more. It is sero-fibrinous, or may be hemorrhagic, and if the condition causing it be that of sepsis it is quite likely to become purulent. In the sero-fibrinous case the membrane is covered by a thick, creamy film which may form in ridges or present a honeycombed appearance. The hemorrhagic exudation is more commonly seen in connection with acute tuberculosis, belonging also to destructive processes in the aged, as cancer and general tuberculosis. In the purulent effusion the liquid is of creamy consistency; in simple rheumatism it is serous in character.

Effusion is to be diagnosed from enlargement of the heart, which is accompanied by an apex beat against the chest wall in the lower left corner of the dull area, and from cases attended by a positive increase and greater distinctness of the heart sounds. It is also to be diagnosed from tumors, aneurisms, pleuritic effusion and consolidation of the borders of the lungs, and the heart conditions which are more apt to be found in adults than in children. In encysted effusion of the pleural sac it is easy to confuse the condition with those of copious pericardial effusion. In pericardial effusion the apex beat is not seen when the patient is lying upon his back, as when the heart is enlarged and responsible for the increase in the dull area; nor is it always observable even when the patient is in the upright posture; whereas, in hypertrophy the force of the apex beat is considerably increased, in some cases amounting to the "sledge-hammer" stroke. The nature of the fluid that is present in pericarditis and its quality are to be differentially known only upon aspiration. If the state of the patient be one of general sepsis it is reasonable to suppose that it is purulent. If effusion follows quickly upon acute rheumatism it is likely to be serous; if it comes on more gradually in association with tuberculosis or tubercular pleurisy it is more apt to be hemorrhagic or sero-hemorrhagic.

Occurring without effusion, pericarditis is not always easy of diagnosis. It has been repeatedly shown in post-mortem examinations that pericarditis has not been recognized during life, and that it has existed and gone on to resolution with adhesions without attracting attention. Especially is it likely to be overlooked in cases of sub-acute or chronic rheumatism in careless people who pay but little attention to their health, and fail to notice or report

heart symptoms in connection with moderate outbursts of rheumatism. In diagnosing it from dilatation of the heart the waxy character of impulse common to the latter, the more distinct shock of the cardiac sounds as observed by palpation in dilatation, the clear, sharp and valvular heart sounds that are seen in this condition, and the compression of the lung resulting in the tympanic note in the axillary region that goes with extensive dilatation, serve to differentiate this condition from pericarditis with effusion. In dilatation the area of dullness is not triangular nor is it likely to reach well upward along the left sternal margin, excepting in cases of mitral stenosis, which has its own peculiar sound; nor is it as likely to reach as high as the fifth or sixth interspace without producing visible and palpable impulse. In dilatation the heart sounds and area of dullness are more or less constant, whereas, in effusion, especially when the quantity is considerable, there is likely to be a shifting of dullness upon change of posture by the patient.

It is not to the discredit of the physician if he mistake the effusion of the pericarditis for extensive dilatation. Osler recites that excellent observers have been unable to discriminate between the two, and that paracentesis of the heart has been performed when paracentesis of the pericardium was intended. Extensive exudation, amounting to a pint and a half or two pints, has been mistaken for pleuritic effusion. In septic pericarditis with extensive effusion there is likely to be confusion, the violence of the heart's action assisting in determining the character of the case. Suffocative attacks are not so likely to attend upon dilatation or pleuritic effusion as upon pericarditis, nor is there likely to be the palpitation and precondal anxiety and distress.

Prognosis.—The prognosis in pericarditis will depend in large part upon the nature of the case. In association with violent cases of rheumatism it may be exceedingly grave. In simple pericarditis with sero-fibrinous effusion, the type most common in connection with rheumatism of moderate severity, recovery is the rule. In purulent effusion occurring in association with severe septic diseases, as general septicemia, malignant scarlet fever, putrid diptheria, small pox and tuberculosis, the prognosis is correspondingly grave. As has been shown, extensive pericardial inflammation and adhesions may occur without recognition, but those cases are more likely to be seen in adults, especially in persons of middle life, than in children. The heart diseases of child-life are more obscureable, though pericardial inflammation may be altogether overlooked when closer attention is given to the general constitutional state and the physician is not on guard for heart complications. Septic pericarditis is always dangerous, generally fatal, though occasionally recovery results. When a favorable issue ensues the patient drags along over a long

period of time in a variable state of health, recovery being protracted and sometimes never complete.

Treatment.—The treatment of pericarditis and that of endocarditis are, in a general way, the same, and will be considered in a separate chapter, the surgical treatment being discussed in association with the discussion of other surgical diseases of child-life.

CHAPTER LXVI.

TREATMENT OF ENDOCARDITIS AND PERICARDITIS.

General Considerations—Diet—Medication—Keynote Remedies.

General Considerations.—The treatment of endocarditis, pericarditis, and myocarditis require the same general hygienic, dietetic and constitutional measures, and will, therefore, be considered in connection. Primarily the treatment will have to be directed towards the relief of the condition that is causing the endocardial inflammation. It will not be enough to direct attention to the joints if rheumatism be the cause, nor to the particular exanthemata that is responsible for it. It is necessary to prescribe for the totality of the symptoms, the condition of the heart being key to the situation. If the case be one of general typhoid, for instance, the remedies that are most useful in abdominal typhoid or in the nervous type will be of little avail in combating the heart process; however, in a general way they may be what the patient in his real condition demands. But it is desirable to allay the inflammatory process that is going on in the heart at once, not more with the thought of saving the patient from the immediate results of endocardial inflammation than from the secondary sclerosis which impairs the heart throughout the whole life. It is essential that those remedies should be selected which are known to have specific effect upon inflammation of the heart membranes and in whose pathogenesis the heart symptoms which may be present have been recurring. The suppression of rheumatism of the joints by antipathic treatment, as the cold-tar derivatives, colchicum in full doses, and the various preparations of potassium, often being about metastatic inflammation of the heart membrane; so also does this lesion result from efforts at the immediate cure of inflammation of the joints by the application of ice or the use of the cool plunge bath. If there be a disease in which there is danger of existing metastatic inflammation that imperils life that disease is rheumatism. Antipathic treatment most often fails to cure

acute rheumatism, and the frequency with which "heart failure" and chronic heart diseases result upon the exhibition of this treatment should cause the homoeopathician to abandon it from his armamentarium.

The hygienic treatment of children suffering from acute endocarditis consists in absolute rest in the recumbent posture—the patient not being allowed to sit up nor thrash about the bed, nor change posture unnecessarily throughout the whole course of the heart illness—together with careful protection of the surface by incasing the child in flannel underwear, which should be changed only when necessary for cleanliness, and then always when the child is in the recumbent position and with the least amount of exertion on the part of the child, and, finally, and important, the exercise of extreme care that the little patient be kept as free as possible from violent emotion. Company should be strictly forbidden the sick room. Even pleasurable pastimes and visits from children of whom the little patient is fond are often productive of harm. Unnecessary fretting and worrying should be guarded against, quietude of mind and body being a *sine qua non*.

Diet.—The diet should be light and nourishing. Overloading of stomach excites rapid and violent heart action. Likewise severe efforts at stool are to be avoided. The blandest possible diet that will sustain the patient is what is required. If milk agrees it should form the basis of nourishment because of the effect of lactic acid upon the rheumatic state, but it does not always agree and frequently requires the addition of peptonizing powders in order that it may be readily digested. If the process be septic in character milk should never be given raw. Lean beef broth, made in an open stew-pan, lean mutton broth similarly prepared, oat meal gruel, barley gruel, rice mush, whipped eggs, and various table delicacies, *so blanc mange* from imperial granum, tapioca, sago, gelatin, and similar articles are permissible. Juicy fruits, excepting grapes, are allowable in moderate quantity, especially baked apple, or even scraped raw apple. If considerable stomach disturbance is present, as is sometimes the case, it may be desirable to limit the amount of nourishment given per os to the minimum, relying in part upon rectal alimentation by bovine and milk, Murdock's Liquid Food, Valentine's Beef Juice and milk of other suited rectal nourishment. Oil baths, especially over the chest, under the arms and on the lower surfaces of the body and over the abdomen are beneficial. Alcohol should be strictly interdicted, even in the severest debility attendant upon inflammation of the heart membrane. It is certain to excite increased heart action and only adds to the fuel of the inflammatory flame. Hot milk serves a much better purpose in tiding over crises, but if the patient object to it simple hot water, which is preferable to alcoholic stimulants, answers as good a purpose.

The child should not be allowed to assume the upright position during the existence of acute endocardial inflammation under any circumstances, nor even the semi-upright posture.

Medication.—In the commencement of endocarditis without apparent infective cause *Ferrum phosphoricum* will be more often required than *Aconite*, from the fact that there is not often present the characteristic heat, thirst, restlessness and anxiety of the latter remedy. The temperature is not greatly altered, nor are the febrile symptoms pronounced, as a rule; yet the evidences are those of inflammatory action, and unless the heart be greatly excited as shown by turbulence of its action, unusual activity and irregularity of the pulse and pronounced palpitation *Aconite* will not be called for, *Ferrum* serving a better purpose and more clearly meeting the indications.

For the nervous, turbulent heart there is no better remedy than *Aconite*. No matter how sudden and violent its action and how great the excitability of heart and pulse *Aconite* is one of the best remedies to overcome it. It lessens the rapidity and renders less violent its efforts, and if used in the moderate attenuations, from the twelfth upward, is perfectly safe. In the tincture or even the lower attenuations in young subjects it is too depressing and weakens the effort of the heart beyond the safety limit. In old school practice *Aconite* is dangerous, and in crude homoeopathic treatment it is almost as certainly so. *Aconite* is to be thought of especially for endocarditis in association with acute pleurisy. *Ferrum phosphoricum* or *Veratrum viride* are more likely to be needed for its attendant pain.

Veratrum viride.—The action of this remedy is more like that of *Aconite* and *Ferrum phosphoricum*, but the heart labors more violently and the condition is less one of palpitation and nervous excitability than the hard, feeble action as shown by labored beat of the heart against the chest wall. The temperature is higher, the pulse full and bounding; the pulse is that ordinarily ascribed to *Aconite* but that doesn't belong to it. *Aconite* shows excitability and its pulse-stroke is more defined than *Veratrum viride*, whose pulse rolls or bounds with a full even bound under the finger. The dyspnea and oppression of *Veratrum viride* are more those of acute congestion of the lungs. Capillary stasis occurs. The mental state is that of absolute indifference rather than acute restlessness and anxiety, and while the patient may be hot the skin is not moist or mottled, while with *Aconite* it is hot, dry, and burning. *Ferrum phosphoricum* is simply hyperemic without intensity or dryness and without the moisture and relaxation of *Veratrum viride* and *Gelsemium*.

Bryonia.—*Bryonia* is especially adapted to inflammation of the pericardium but is equally applicable to endocarditis when seen in association with rheumatism. Its sharp, stabbing pain,

great aggravation of the pain upon motion, whether it be from cough or change of posture, are so characteristic that this remedy will always be thought of in this connection. *Bryonia* more than any other remedy has special affinity for serous membranes, and is homeopathic to effusions of serum and lymph and to vegetative processes and thickening serous structures. Even when its characteristic pains are not present it is still applicable to endocarditis with fibrinous exudate as revealed by the heart sounds. Its fever is intense, and there is hard frontal or occipital headache. The dyspnea, pain, and valvular murmurs are intensified upon motion, and are increased with each new manifestation of joint involvement.

Belladonna is more like *Veratrum viride* in its general congestion and heart symptoms. The pulse is harder than that of *Veratrum viride*, the action of the heart is violent; stasis of the capillary system, with sensation of aching and violence in the region of the heart, and sharp spasmodic pain, leaving as quickly as it came, call for *Belladonna*. The patient is usually soporific or delirious. The eyes are injected, the pulse is intermittent, and the pupils are usually dilated. When endocarditis occurs in the first stage of scarlatina, or with rheumatism of the joints, or with unusual redness and tenderness and swelling *Belladonna* will often be found an excellent remedy, though not so well adapted to the rheumatic stage as *Bryonia*, *Rhus tox.* and other remedies.

Rhus tox.—*Rhus tox.* will be found to be among the most reliable of remedies for either endocarditis or pericarditis that results from acute rheumatism from exposure to cool rains or from playing in the water. Children who are well and strong who have been wading in streams and who have been caught in cold rains, in whom rheumatism starts up with early heart affection are *Rhus* subjects. It is also to be thought of in sub-acute or chronic inflammation of its membranes with aggravations occurring at night comes on and with every change of the weather. The pains are dull and aching rather than sharp and lancinating, and the characteristic *Rhus* restlessness and inability to lie quiet, even though the symptoms are little benefited by stirring, will call for it. In pericarditis following upon septic conditions, especially typhoid fever, *Rhus* will often be found the simillimum. It follows *Bryonia* well where the latter remedy has been discontinued by the acuteness of the symptoms, but should not be used alternately with that drug as commonly and carelessly practiced. For chronic endocardial and pericardial rheumatism *Rhus tox.* in the high attenuations, from the two-hundredth to the one-thousandth, is often curative. In all chronic rheumatic conditions when this remedy is needed the high attenuations will prove most satisfactory. When given they should not be often repeated.

Digitalis.—*Digitalis* is more applicable to functional derangement of the heart than to the organic ailments, serving as a tonic

to the heart and increasing the perfectness and degree of its beats. It quickens and intensifies the action of the heart when given in large doses, but unquestionably, by its irritating properties, contracting the heart muscles and thus throwing the ventricles into tetanic spasms, may cause death. It should be used with exceeding caution if at all, and never in crude doses. It is applicable to sub-acute inflammation of the heart with feeble, irregular, slow pulse and with very rapid and irregular heart action. This fact is much like that of *Aconite*. In the latter case the patient lacks the general nervousness that will call for *Aconite*. Sensations as if the heart would stop beating, and heart's action excited by the least motion; it is especially applicable to pericarditis with effusion, very feeble and irregular action of the heart, and great prostration. It is not necessary to give *Digitalis* in full doses. When indicated it does quite as well or better in the moderate attenuations, from the third up, and in confirmed cases of long duration it will often be found better to prescribe it for the special symptoms of *Digitalis* in the thirtieth potency.

Gelsemium.—*Gelsemium* is an excellent remedy for the nervous palpitations of heart inflammations with excessive throbbing of the heart, violent and rapid beating, throbbing of the vessels of the neck and pulsating headache in the forehead and temples. Alternating congestion of the blood in the head and heart. Blood seems to rush to the head in excessive quantity and is followed by quick alternating flush of the face and neck. In violently perturbed heart action, especially in neurotic pains, *Gelsemium* is second only to *Aconite*. In the palpitations of phthisis, pneumonia, and typhoid fever, I have found it especially helpful as an intermittent remedy.

Gelsemium.—*Gelsemium* is adapted to cardiac neuroses with sensation as if the heart would stop beating unless the patient moved. The heart's action is slow and feeble, the pulse frequent, soft, weak, and almost imperceptible. The degree of inflammatory involvement is slight yet sufficiently pronounced to cause irregularities just described. Heart symptoms in association with remittent fever or malarious fevers which assume typhoid types, with heart palpitation and soft murmurs, may need *Gelsemium*. It is not, however, a remedy that will be often called for in typical cases of pericarditis or endocarditis.

Kalmia latifolia.—*Kalmia* is especially indicated in acute pericarditis attendant upon rheumatism. The rheumatic process travels from joint to joint, attacking the heart with sharp, severe pains that take away the breath, and that cause rapid feeble beating of the heart with paroxysms of extreme anguish. *Kalmia* acts promptly when called for and is not likely to be called for except in the acute migratory type of rheumatism, in which the heart function is strong and violent. Here its action is much like *Cactus*.

Cactus.—*Cactus* is indicated in both endocarditis and pericarditis where there is a sense of severe contraction about the wall as if it were squeezed in a vise. Violent contraction of the heart muscles, turning the blood into the arteries with great force; painful sensation of contraction in the chest as if the heart did not have room in which to beat. *Cactus* is especially adaptable in hypertrophy of heart in young people. Patient cannot lie on right side; pulse is quick and throbbing; face and fingers pale. This remedy seems to moderate the irregular action of the heart, and is useful in intense palpitation and fluttering sensations. It is especially to be thought of in young girls about menstrual time who suffer from nervous palpitations at that time. Violent heart action as the result of fright.

Colchicum.—*Colchicum* is especially adaptable to heart disease following upon acute rheumatism, with sudden development of violent cutting and stinging pains in the chest, with great depression and dyspnea. Heart's action is weak and muffled, and the pulse is short, almost imperceptible, as with *Veratrum viride*. Palpitation, stitches about the heart, and even loss of consciousness upon assuming the upright position.

Arsenicum.—*Arsenicum* is among the best of remedies for septic endocarditis and pericarditis, and for dropsical conditions of the heart with general edema and puffiness about the eyes and feet. Heart is irritable and irregular in action, intermittent, and the child shows the heart cachexia and general arsenical debility.

Cimicifuga.—*Cimicifuga* is an excellent remedy in subacute rheumatic conditions, or malarial rheumatism with heart involvement. Pains over the heart region or over the chest and down the left arm with palpitations, dyspnea, livid face, and cerebral congestion. *Cimicifuga* is specially indicated in choreic palpitations and irregular tumultuous action of the heart.

Kali carbonicum.—*Kali carbonicum* will be called for in late stages of endocarditis and pericarditis with sharp, stitching pains about the heart and to the shoulder blades. The palpitation comes on in spells, the pulse is irregular and intermittent, and there are ebullitions with heat from the abdomen to the head and pulsations of either.

Lachesis.—*Lachesis* is not often called for in the heart diseases of children but will sometimes be found beneficial where the paroxysms of palpitations, smothering depression of the pulse, and pericardial anxiety follow upon wakening, come on quickly, the child showing great fright for fear of suffocation.

Phosphorus.—*Phosphorus* is adaptable to endocarditis occurring during inflammatory rheumatism or pneumonia, the right side of the heart being especially affected. It is accompanied by debility, anguish about the heart, systolic bellows—murmur at the base, and general cachexia.

Spigelia.—*Spigelia* is one of the best heart remedies of the materia medica, covering sharp, shooting pains through the heart to the back and radiating down the right arm, and the spine. There is great oppression or anxiety about the heart, with a thrilling or purring sensation from that organ. Heart beats tumultuously and out of harmony with the pulse. Its action is so violent that its beats are audible. The sharp, shooting pains of *Spigelia* seen in association with rheumatic pericarditis are the characteristic symptom that will call for this remedy. The stabbing pain through to the back, with its extension down the arm and spleen are important indications for its use.

A special remedy that is deserving of mention is *Aper methylis*; feeling of suffocation as though patient would smother for want of air. Pulse not so irregular, intermitting every third or fourth beat. Heart failure in malignant diphtheria and scarlet fever.

Key Notes.—*Argentum nitricum*.—The patient thinks his heart stops beating.

Aurum metallicum.—Fatty disease of the heart and characteristic hypertrophy without dilation.

Badiaga.—Severe characteristic debility.

Benzoic acid.—Rheumatic and gouty affections of the heart with the characteristic *Benzoic acid* urine.

Bismuth.—Endocarditis with gastritis.

Brassica.—Patient cannot lie on the right side. Muscular enlargement without valvular affection.

Cacarea carbonica.—Anxiety, dread of heart disease.

Cannabis indica.—Sensation as though drops of water were trickling from the heart.

Cephus arsenicosus.—Cardiac chorea and general choreic symptoms affecting the heart.

Kali bichromicum.—Cold sensation about the heart.

Iodum.—Valvular vegetations following endocarditis.

Lurocranus.—Sensation as if the heart would turn over while lying down.

Mercurius cyanatus.—Ulcerative endocarditis with rapid heart failure from malignant cardiac disease.

Muriatic acid.—Pulsations of the heart felt in the facial blood vessels.

Naja.—Sense of oppression in the chest as if pierced by a hot iron and pressed by a heavy weight.

Natrum muriaticum.—Feeling of coldness about the heart, worse during mental exercise.

Petroleum.—Feeling as though there was a cold lump in the heart.

Phytolacca.—Chronic rheumatism; shocks of pain in the cardiac region shooting into the right arm.

Plumbum.—Chronic endocarditis and pericarditis.

Psorinum.—Pericarditis of psoric character; rheumatic carditis with effusion.

Sanguisina.—Sensation as though hot water were pouring from the breast into the abdomen.

Spongia.—Chronic effusions of the heart with suffocative spells and coarse breathing.

Tarentula.—Rheumatism of the heart caused by irritating the extremities in cold water.

Veratrum viride.—Dyspnea from compression of cardiac and pulmonary disease.

Zincum metallicum.—Sudden shocks and jerks in the cardiac region.

Special symptoms that call for special remedies that are frequently met with in connection with heart disease, both in children and adults, are as follows:

Pains extending down the left arm call for *Aconite*, *Crotalus*, *Rhus tox.*, *Spigelia*, *Tabacum*.

Pains extending down the right arm call for *Phytolacca* and *Spigelia*.

Pains extending diagonally from the heart toward the right chest call for *Apsu*.

Pains from the heart through to the back call for *Artemisia*, *Crotalus*, *Gelsemium*, *Kali carbonicum*, *Lilium tigrinum*, *Spigelia*.

Pains extending into the neck indicate *Graphites* and *Tabacum*.

Pains extending from below upward call for *Bromium* and *Mercurius*.

Pain extending from behind forward call for *Oxalic acid*.

Pains extending to the stomach and abdomen indicate *Kalmia latifolia*.

Squeezed sensation of the heart indicates *Cactus*, *Iodum*, *Nuxvomica*, *Tarentula*.

CHAPTER LXVII.

MYOCARDITIS.

General Considerations—Symptoms and Course—Diagnosis—Treatment—Diet and Hygiene.

General Considerations.—Myocarditis is an inflammation of the muscular tissues of the heart. It is thought now to be invariably due to septic infection, resulting from the same causes that excite pericarditis and endocarditis. It is easy to understand that infection may reach the muscles of the heart directly through the membranes within and without from septic infection of the pericardium through the coronary arteries. Myocarditis not only results from pericarditis but is witnessed in the course of any of the infectious diseases that excite inflammation of the heart membranes, the streptococci and staphylococci common to pus being the exciting micro-organisms. Endocarditis is seen more often in association with septicemia or pyemia than with rheumatism, the rheumatic process having preference for the membranes of the heart.

The more common cause of myocarditis is the sepsis of diphtheria, scarlet fever, typhoid fever, small pox, typhus fever, and other similar diseases.

The process that takes place in the heart muscles is that of round-cell infiltration with disintegration of muscular tissue and the formation of abscesses. Interstitial inflammation of the muscle may also occur as in muscular tissue-lesion, with eventual development of sclerosis and weakening of the heart muscle, or perhaps aneurismal dilatation.

Symptoms and Course.—Myocarditis is rarely if ever seen as an idiopathic disease or as occurring alone. It is almost invariably dependent upon pericarditis or endocarditis. It makes its attack usually in the early part of the night and suddenly, its peculiarly characteristic symptom being dyspnea with anxiety, distress and severe asthma. Its paroxysmal attack is known as cardiac asthma and is usually seen in connection with very pronounced evidences of heart disease, much more common to later life than child-life, following upon the acute infectious diseases and, occasionally, upon endocarditis and pericarditis. Other symptoms that are seen in myocarditis are palpitations, dyspnea, dilatation, heart failure and syncope, with absence of the positive physical signs of pericarditis and endocarditis. The objective symptoms just named will be seen also in association with the physical signs of the primary affections of the heart membrane, the two pathological states occurring at the same time.

Diagnosis.—The diagnosis of myocarditis is difficult, even impossible. In fact it so rarely occurs altogether independently of external or internal membranes that the symptoms of the various pathological lesions are too intermingled for actual differentiation. Myocarditis is more likely to show arrhythmia with periodical acceleration of the pulse because of the changes in the vigor and tone of the heart walls. The cardiac arrhythmia is a pathognomonic symptom, and if it occur in distinct paroxysms, if there be pronounced absence of the pericardial contraction, and if the endocardial bellows murmur it may be safely estimated that myocarditis is the lesion before us.

Treatment.—The remedies that have been mentioned as homeopathic to pericarditis and endocarditis are in a general way the remedies for myocarditis. If it is shown that it is not in anywise due to injury of the heart muscle, from muscular strain placed upon the chest, or the traumatism of surgery, *Arnica* may be demanded. *Rhus tox.*, *Colobium*, *Cnicifuga*, *Kali muraticum*, and other remedies that are known to affect special muscular structures, will be demanded. If degeneration of the heart muscles has occurred *Arsenicum* and *Phosphorus* are especially required. Unusual debility of the heart calls for *Batago*, and muscular enlargement without valvular affection indicates *Brousson*, *Cacta*, *Capricorn*, *Kalmia*, *Digitalis*, *Spigelia*, *Mercurius cyanatus*, *Lachesis*, *Crotalus*. In a general way it is safe to differentiate between remedies that are suited to septic states and those that are indicated in inflammatory and rheumatic conditions. Myocarditis is so often seen in connection with the sepsis of acute exanthemata, suppurative pericarditis and suppurative pleurisy that the class of remedies that are demanded in these states are those in which the similitum will most often have to be selected for myocarditis.

Diet and Hygiene.—In a general way the diet will have to be nourishing and supportive, the exercise and general hygiene of the patient being directed toward conserving the strength and relieving the heart from extra labor and excitement. Avoidance of violent exercise is demanded and general passivity, mental and physical, is required. Septic abscesses of the heart muscles if superficial may empty into the pericardium and eventuate in complete recovery, with perhaps slight muscular sclerosis and scarring. If abscesses of even very small size burrow through the endocardium, emptying into it, infarcts in remote portions of the system, especially the brain and lungs, may follow.

CHAPTER LXVIII.

FUNCTIONAL DISORDERS OF THE HEART.

General Considerations—Etiology—Symptoms—Treatment.

General Considerations.—There are certain disturbances of the heart that come under the classification of cardiac neuroses or functional disturbances of the heart and cause more or less disturbance in the health of children, especially those of delicate or neurotic habit. There may be motor derangement or sensory derangement, or a combination of both motor and sensory derangement. The former consists of derangement of rhythm, as arrhythmia, tachycardia, bradycardia, and momentary arrest of the heart action, or syncope. The sensory derangement may consist of pain about the heart, sensation of distress and discomfort, not definitive pain, but simply a consciousness of having a heart, the attention of the child being directed more or less constantly to this organ. The especial condition that comes under the combination of motor and sensory disturbance is the palpitation quite commonly seen in delicate subjects.

Etiology.—Children of weak, susceptible, nervous constitutions, who are especially sentimental or emotional in disposition, who are easily excited, in whom the nervous condition is unnatural or exalted, are liable to the irregularities mentioned. They may depend also upon lithemic states of the system and derangement of the excretory processes or metabolism. They are also seen, and more especially, in association with various disorders of the nervous system, as chorea, epilepsy, diseases of the brain and spinal cord, and in affections of the nervous system from acute exanthemata or other chronic infection, especially infective processes about the heart. It is an unexplained fact that various infectious diseases of the heart are seen in association with chronic enlargement of the tonsils. Besides these causes it is well also to bear in mind that various disturbances in the regularity of the circulation of blood are due to sexual neuroses. In very young subjects these consist in adherent prepuce with smegma, or, in girls, to adherent hood and vaginal irritations. Seat worms are also the cause of irregularities of rhythm and action of the heart in subjects who are especially nervously inclined.

Certain inherited tendencies, as the gouty state, tuberculosis, syphilis and other constitutional conditions, among which may be mentioned the neurotic habit as it is seen to run through families, often excite or are responsible for cardiac neuroses.

The causes of cardiac disturbances that are functional in character relate as a rule to the nervous system, as intense emotion,

such as fever, anger, passion, intense grief, or fright, and those that act reflexly upon the nervous system, as diphtheria, sexual irritations, disturbances of the digestion, and other individual reflexes. Sometimes severe functional disturbances of the heart will result upon violent exercise at play, especially if indulged in immediately after a meal when the stomach is full, or if the exercise is continued at the expense of the nervous system until the child is worn out with exercise, the fatigue reflecting itself upon the cardiac center.

Symptoms.—The general symptoms of functional derangement of the heart consist usually of disturbances of the *motor* system. Sensory derangements are not nearly so commonly seen. The general complaint is of acceleration of the action of the heart, though in individual cases it may be retarded or very irregular. The rhythm is disturbed more particularly when there is a great deal of pericardial distress, or a sense of pain or oppression about the heart. Pseudo-angina is rarely seen in childhood—angina pectoris practically never. Cyanosis is not very apt to attend upon functional disturbance, but occasionally occurs, and when momentary arrest of the heart's action is pronounced intense pallor is witnessed, with fainting spells, preceded as a rule by momentary nausea. Physical examination affords but little information that is of special value. The heart's action will usually be found to be rapid and somewhat turbulent, but the prognosis can be determined by palpation and even by inspection. The impulse is harder than normal and generally more extended. The first sound of the heart is hard, valvular and shortened in duration. The second sound may remain distinct or be slightly accentuated. Murmurs are not likely to be heard unless the heart's action is exceedingly rapid or very irregular, in which event mitral or systolic murmurs may be present. Tachycardia is a very common symptom in children in every disease, and is also common to violent emotion and undue exercise, especially that which is pleasurable. In special instances of functional disturbances the heart's action may be accelerated to twice its normal rate or even more than that. It is more commonly seen in nervous children who play hard. Its opposite, bradycardia, is not at all common to children, though seen in unusually slow convalescence from an acute exanthem, acute rheumatism and in certain of the disorders of the digestive system, especially jaundice. Here the heart is not only slow but its beat is feeble. Unusual sluggishness of the heart's action is observed also in coma, and, while the opposite is generally the rule, it may also be seen in hysteric subjects, especially those given to depression and despondency.

Arythmia is encountered in nearly all the functional disturbances of child-life. The heart may miss a beat altogether, or there may be an alternation of strong and weak contractions, an alterna-

tion which is more or less regular. The peculiar, galloping rhythm in which two or three of the contractions of a ventricular character are followed by an absence of beat for an instant, this followed by quite an irregular heart action, is one of the most common of the arrhythmic states and bears the name of *delirium cordis*.

Syncope occurs through all the causes that produce it in adult life. It is not as commonly seen in children as in youths, but may result from fright, anemia, slight injuries, severe pain in the bowels, and emotional conditions.

Palpitation is not infrequently met with in children of nervous temperament who are given to undue excitement from slight cause, especially those who are prone to disturbances of the digestion from gourmandizing and from indulgence in rich and indigestible foods. A distressing palpitation also accompanies pronounced anemia. Pain is not present as a rule but the condition is one of distress and discomfort. The symptoms belonging to palpitation are those of severe action of the heart, a fairly runaway beating, with defined precordial sensation amounting to actual discomfort, and in severe cases becoming exceedingly annoying and distressing.

Heart consciousness, precordial distress, precordial pain and other symptoms of like character are not often met with in children in whom there is functional distress. These symptoms are seen in connection with organic heart ailments, more rarely are dependent upon chronically enlarged tonsils, and are also seen in connection with fibroid enlargement.

The diagnosis of functional disorders rests upon the symptoms which have been enumerated in connection with the different varieties thereof, together with absence of the physical development of organic cardiac disease. The diagnosis is in some cases more or less difficult, but the conclusions of the physicians will have to be reached by excluding organic diseases of the heart. The prognosis is favorable, and it is a mistake to presume that the violent functional disturbances are at all likely to develop into organic disease. The causes that operate to produce functional disturbance are often of such a character as to render the heart more liable to inflammatory processes that result in permanent injury, but in no case is the functional disorder responsible for this tendency.

Treatment.—The treatment of functional derangement of the heart must of necessity be prophylactic and systolic. It being more commonly seen in children of nervous and delicate temperament, when it is ascertained that the heart habit is present in such subjects, care should be exercised that the patient be kept as free from violent emotion, exercise and errors in diet as possible. Functional derangements are sometimes due to a lack of hygiene in the home, the air being foul and stuffy, especially that of the sleeping apartment, and the house permeated with penetrating perfume

from pot plants or from the culinary department. A plentiful supply of fresh air in the sleeping room and nursery will often promptly overcome the tendency to derangement in young children. In older subjects more attention should be paid to exercise and diet, undue violence at play being forbidden, and indulgence in rich and indigestible food being proscribed. If sexual irritation or intestinal worms be the cause of the disturbance attention will have to be directed to these channels. Many of the neuroses of childhood are dependent upon an unhygienic condition of the sexual organs, the heart suffering as much as any individual organ from sexual neuroses the office of the official surgeon being here demanded. If in any sense depending upon anemia the condition that induces it should be removed. If lithemia is the cause of the disorder the usual diet should be prescribed and medicines directed toward overcoming the condition.

Children are frequently sufferers from nervous derangements, including heart neurosis, from indulgence in tea or coffee, and infants who are still at the breast are also made to suffer severely from over indulgence in this direction by the mother. The neurotic child should not be allowed tea or coffee in any strength. Spices and condiments generally should be excluded from the diet of childhood, the nourishment being simple and plain but nutritious. What is one child's food is another child's poison, hence the necessity for carefully studying the individual idiosyncrasies and digestive possibilities of the individual patient.

The remedies that will be required for functional heart disturbance depend in good part upon its cause. If it is due to an exalted state of the nervous system *Aconitum*, *Chamomilla*, *Coffea*, *Nux vomica*, *Ignatia*, *Monarda*, *Hyoscyamus*, *Glaucium* and similar remedies will be required. *Aconite* and *Glaucium* are two of the best remedies for the nervous palpitations of children. *Coffea* should be prescribed if the derangement is the result of fright. *Ignatia*, if from grief or violent mental emotion. *Chamomilla* and *Nux vomica* allay the nervous irritations of the system and heart that result upon violent exhibition of temper. *Digitalis*, *Lachesis*, *Strophanthus*, and *Lycopus* will be found beneficial if the heart's action be unusually slow and feeble.

Cactus, *Kalmia*, *Spigelia* and *Bryonia* should be remembered in association with precordial distress and heart pain.

Hyoscyamus, *Gelsemium*, *Ignatia*, *Stramonium*, *Belladonna*, and their type of remedies in general, will be demanded for the violent runaway heart of great nervous excitement.

Cina, *Santonin*, *Stannum*, *Spigelia*, *Chenopodium*, *Mercurius* and allied remedies will have to be administered if intestinal or seat worms are responsible for the derangement.

For special indications for individual remedies reference may be had to the chapter on treatment of pericarditis and endocarditis.

CHAPTER LXIX.

HEART FAILURE.

General Considerations—Etiology—Symptoms—Treatment—Acute Type.

General Considerations.—The term heart failure is an ill-defined and unhappy one. It increases the multitude of errors in diagnosis, yet it is to a certain extent an applicable term, in that death from heart disease is necessarily due to failure of this organ to continue its work. As a specific affection, perhaps deserving of mention in this connection, it may be said that the condition covered by this term is really diffuse degeneration of the heart. It occurs in a large proportion of cases of organic heart disease, and is the immediate cause of death in all cases occurring during chronic heart processes excepting those resultant upon blood-clot or thrombus. The various organic heart lesions that result in valvular insufficiency and ventricular dilatation throw extra burdens on the heart muscles. In very many cases compensatory hypertrophy of muscular tissue occurs, and the heart is intensified in proportion to the demands made upon it by the diseased condition. The patient goes along through life with an amended anatomy sufficient to sustain life and accomplish the functions belonging to the heart with a reasonable degree of perfection. In other cases compensation is not adequate to the necessities of the case and parenchymatous degeneration ensues. Granules of fat appear in striae and fatty degeneration follows. In other cases the degeneration is waxy and amyloid material occupies the spaces between the heart striae, producing degeneration, the muscle growing yellowish or greenish, losing its firmness and elasticity and becoming boggy, friable and fragile.

Etiology.—Degeneration is necessarily a secondary condition. It follows upon chronic heart processes, usually valvular lesions. Hypertrophy is the first abnormality to occur in the heart and this is followed by dilatation and degeneration with corresponding disturbances in compensation. The condition is also seen in the course of long-continued and frequently-occurring asthma, in Bright's disease, empyema, aneurism of the aorta, chronic bronchitis, and in special cases of diseases of the membranes of the heart. General typhoid degeneration also results from states of profound anemia in tuberculous and marasmatic subjects, and is also directly resultant upon the acute infectious fevers, the condition of the heart in this relation being one of septic myocarditis, already described. Chronic debilitating processes generally weaken the muscles of the heart just as they weaken other mus-

cles, and the occurrence of violent emotions in the subjects of heart debility from these causes usually results in sudden heart failure and death, the strain being greater than the degenerated heart muscle can stand. Unusually severe and prolonged exercises that throw especial burdens on the heart are also responsible, even in athletes, for sudden heart failure, because of the degeneration of the fibres of heart muscle from the unusual exercise to which they have been subjected.

Doubtless a large proportion of cases of sudden death in the course of acute disease, as pneumonia, epidemic influenza, typhoid fever, and similar states that are attributable to heart failure are made possible because of muscular degeneration of that organ, not being especially observable during health, but becoming manifest and fatal when the burden of acute disease is thrown upon the system. In other cases the heart may have been perfectly normal, or practically so, when the acute ailment sets in, rapidly taking on the degenerative process as a result of septic infection, because of the altered character of the blood supplying the heart and the additional labors that it has to perform through imperfect blood nutrition.

Symptoms.—Heart failure may be sudden or perhaps preceded for a considerable length of time by objective symptoms. It may be that the patient has been growing weaker, gradually losing energy, and that unusual exertion excites the heart's action and rapid breathing, this being more noticeable as the patient ascends stairs or any elevation. Coming in connection with illness, these symptoms may extend over a period of weeks with eventual edema of the extremities, fullness in the region of the stomach and liver, some mental and physical sluggishness, irregularities of circulation, with floridity or pallor of the countenance and eventual dropsy, cyanosis and delirium, the result of cardiac disturbance. There are no physical signs that are characteristic, beyond the general evidences of valvular disease when this is responsible for the condition. The apex may be slightly depressed if the left ventricle is dilated and the area of dullness may be larger than normal, especially at the right part of the base. The heart sounds are usually somewhat muffled, and systolic murmurs are the result of incoordinate insufficiency of the mitral and tricuspid valves. The general symptoms of increased debility, surface cyanosis or pallor, with nerve palpitations, irregular heart action, dyspnea and edema, coming on in the course of chronic ailments, tell their story of gradual heart degeneration.

Moderate heart failure occurring in the course of acute diseases, as pneumonia, scarlet fever, rheumatism, typhoid fever, yellow fever and other diseases present premonitory symptoms as a rule. A patient may be doing fairly well apparently, passing through the regular courses of his disease without unusual symp-

signs of special danger. Convalescence may even have set in and the general state be fairly good when, without attention having been previously attracted to the heart, while rising to partake of a meal, while changing the clothing, while taking a bath, or at efforts at stool, or while engaged in pleasant conversation with the physician, nurse or friend, the patient will suddenly sink back in bed, gasping for breath, shivering in a light, spasmodic movement, intense pallor or deep cyanosis spreading over the face, and in an instant, without warning, life is extinct—from heart failure. It is this mode of termination that is more generally recognized by the laity and profession as the "heart failure" of today. In some cases it is due to unrecognized valvular disease and heart-clot, in others to cerebral thrombus from dislodgment of vegetations of the valves, while in still others it will be due to degeneration of the heart muscles that occurred during the course of acute ailment, but that has not up to the fatal moment presented a pathognomonic systematology. Occurring without warning, there is little opportunity for studying the onset of this type of heart failure; moreover, as a rule the physician is not present.

Treatment.—The treatment of heart failure will depend very largely upon the conditions from which it springs. If seen in the course of chronic heart disease or in other confirmed ailment the treatment will naturally be directed toward the cure of the basic disorder. It is perhaps more commonly seen in connection with kidney disease than in other chronic ailment, though common to anemic states generally, marasmus and infantile atrophy. When the symptoms of heart failure are recognized in the course of a confirmed constitutional disease the attendant is usually powerless, for having been unable to overcome the primal disorder it is not likely that he will be able, when the serious lesion under consideration manifests itself, to bring to bear helps that will so overcome the original disease, upon which the heart condition depends, that he can accomplish satisfactory results in the cardiac ailment.

Occurring in connection with acute disorders, if there are premonitory symptoms calling attention to the heart to direct medication and auxiliary treatment, the suggested difficulty can be successfully met. Occurring quickly, without warning and in full violence, there is absolutely nothing to be done unless the physician be on the spot, when the violent dyspnea, sudden unconsciousness, or other heart failure symptoms show themselves.

Fortunately, heart failure is not as common in children as in adults, though it is not infrequently met with, in diphtheria especially and in other malignant diseases of child-life. When dependent upon a general septic state of the system the systemic medication of the patient with relation to the primary disorder forms the basis of the treatment of the heart ailment, but individual remedies are necessary for the pain, the dyspnea, the syncope,

the convulsions, and other distressing conditions that show themselves as acute heart failure threatens. In many instances there are more than one attack of heart spasms or their characteristic derangement that excite attention, perhaps a second or third being necessary to a fatal issue, and in many cases of diphtheria and other malignant diseases of childhood the heart is seriously threatened more times than one, impending danger being averted by properly directed remedies and other measures.

TREATMENT FOR ACUTE TYPE.—For acute heart failure, which shows itself by objective symptoms of pallor, dyspnea, partial unconsciousness, profound debility, even to collapse, and like symptoms, restorative remedies as *Atonium*, *Camphora*, *Artemisia*, *China*, *Nux vomica*, *Veratrum album* and *Lacris*, will be required. If the symptoms are manifestly those of collapse *Camphora*, *Carbo vegetabilis* and *Veratrum album* will be demanded. If severe pains occur about the heart *Cactus*, *Spigelia*, *Relbunum* and *Kalmia* will be called for. For convulsions *Cicuta*, *Zincum*, *Cyprusum*, *Strychnia*, *Monstrosa* and *Passiflora* will be considered. *Glossinon*, *Amyl nitrite*, *Digitalis*, *Strophanthus*, *Lycopus*, and similar remedies may occasionally be called for as indicated.

Stimulants are not often advantageous, though a few drops of hot whisky and hot water may be used with advantage in severe cases. Alcohol may be applied on pledgets of cloth in the armpits and groins, and hot milk or hot water be administered per os in the sinking spells of acute heart failure. The patient's body should be kept thoroughly warm, hot applications applied to the extremities, with local stimulation by means of friction and heat as necessary. The patient must be kept perfectly quiet, in the recumbent posture and plenty of fresh air admitted to the sick room. Pungent lotions, as camphor, arnica and similar stuffs by olfaction are objectionable. If oxygen is at hand it is one of the most potent agents that can be used, the selected remedy being first administered in hot water, as thus there is much quicker absorption and the patient is given the benefit of the stimulation of the hot water while taking the remedy. In severe cases hypodermic injections of alcohol and other stimulants have been applied with doubtful success. Alcohol sometimes whips the heart to more violent action and thus serves to tide over a crisis, but the reaction that follows is usually harmful.

Copious rectal injections of hot water and hypodermic injections of the indicated remedy in hot water are better than alcohol, no matter how administered.

Gradual heart failure in association with various chronic diseases upon which it depends requires a distinct course of treatment.

SECTION VII.

DISEASES OF THE RESPIRATORY SYSTEM.

CHAPTER LXX.

TONSILLITIS.

General Considerations—Acute Catarrhal Tonsillitis—Symptoms—Follicular Tonsillitis—Symptoms and Course—Diagnosis—Treatment—Suppurative Tonsillitis—Symptoms and Course—Treatment—Incision.

General Considerations.—Inflammation of the tonsils is one of the commonest diseases of the throat, not only in child-life but among adults as well. Occurring as an acute inflammation from a cold, sudden change in the weather, or exposure of the throat by change of clothing, it has as a basis in very many instances the rheumatic diathesis. It is often dependent upon the inhalation of foul air, as from defective plumbing, coal-oil lamps and offensive drains, and sometimes comes on so quickly as to seem to be directly due to the irritating properties of foul gases. In adults it is much more apt to manifest itself as quinsy, or inflammation of the tonsils resulting in abscesses, not only of the tonsil but of the peri-tonsillar tissues. In children it is generally associated with inflammation of the pharynx and is not likely to go on to suppuration as with older people. Its diagnosis is not as easy in infant life as in children of maturer years or in adults, because the younger subjects give us but little complaint of pain or soreness in the throat, and it is not easy to differentiate tonsillitis by its external appearances from simple adenitis or from mumps. Some children seem to be especially liable to inflammation of the tonsils, and upon the least provocation will suffer from tonsillar sore throat. It must be borne in mind that the physiology of the tonsils is a part of child life. They atrophy at about the age of puberty as a rule, and are rarely seen in perfect development after that time. Even when remnants of the gland remain and take on inflammation in adults it is usually but a remnant that is affected, hence the extension of the inflammation into the peri-tonsillar tissue which surrounds it closely and often completely imbeds it.

The function of the tonsils is not clearly understood. It is supposed to be similar to that of Peyer's patches. They are possessed of the property of absorbing the unused saliva, thus preventing waste, and it is claimed also that certain elements of food are absorbed by them in the passage through the fauces; also that they are possessed of an important function in the reproduction of white blood corpuscles. It has been observed that the pharyngeal tonsils destroy pathogenic germs inhaled from the atmosphere, and that that portion of the tonsils residing in the fauces protects the system from invasion by toxic organisms which enter with the food. Bosworth contends that the tonsils are not only absorbing but secreting organs as well. They are evidently a part of the lymphatic system and their inflammations are very often septic, from decomposition of particles of food or noxious substances inhaled which lodge in their crypts. The numerous varieties of bacteria, offensive as well as inoffensive, doubtless find lodgment also, and if decomposition of food particles or of tonsillar debris sets up during the presence of bacteria it is easy to understand how it is possible for a septic state of the system to follow. It is held by some physiologists that a function of the tonsils is the formation of leucocytes, which are thrown out in the salivary secretion; and the microscope shows that the cheesy particles that are secreted in the tonsillar crypts during inflammation of these glands are composed very largely of leucocytes.

It is a significant fact that many of the zymoses are accompanied by or preceded by tonsillitis. This is almost invariably the case with the rheumatism of childhood. By far the greater proportion of rheumatic patients of tender years whom I have been called upon to treat have been previously ill with tonsillitis, and in most cases the development of rheumatic fever has followed closely upon acute tonsillar inflammation. The association of enlargement and inflammation of these glands with diphtheria and scarlet fever is well known, and modern authors are coming to recognize in the various septic conditions of the tonsils the immediate cause of scarlet fever in many, if not in all, instances, and the responsible factor in many of the more violent manifestations of diphtheria. Berge, Dawson, and other recent authors, attribute scarlet fever to sepsis from the tonsils, and in confirmation of this theory present the fact that with atrophy of these glands at puberty the danger of scarlet fever is so materially reduced as to be insignificant. They also support this thought by referring to the fact that scarlet fever may exist in a single child in a family or institution, and that it is always more malignant in those who are known as tonsillar children, that is, those whose tonsils are enlarged and tend to inflammation upon slight cause. My attention has been often attracted by this thought in practice, and during experience in epidemics I have observed that children whose

tonsils are perfectly normal have escaped visitation of scarlet fever, or have been affected by only its mildest forms.

Confirmatory of the thought of its association with rheumatism it is well to suggest that in numerous instances where rheumatism does not develop as an affection of the joints or general system children are frequently the subjects of rheumatic endo- or pericarditis, the heart symptoms manifesting themselves within a few weeks or a few months at most after severe attacks of tonsillitis. In these cases the subjects seem to have escaped general rheumatic fever and yet the sepsis that produces the disease has spent its force upon the endocardium or pericardium, whether acute manifestations of heart trouble have shown themselves or not; and it is well to bear in mind in this connection that rheumatism of the heart membranes is not always recognized in infancy or early childhood, sometimes escaping observation altogether until secondary symptoms have developed.

Whether tonsillitis be directly responsible for the development of any considerable number of cases of scarlet fever or diphtheria or not there is certainly an association between these diseases that must not be overlooked. During epidemics of scarlet fever many children will have tonsillar sore throat, and during epidemics of tonsillar sore throat individual children will develop scarlet fever. The same is true of diphtheria, and the association is so pronounced as to justify the physician in looking well to children who are the subjects of tonsillitis in all eruptive fever epidemics.

Naturally, the tonsils being a portion of the lymphatic system, the disease is more apt to manifest itself in children the subjects of enlarged glands, and in whom some one of the constitutional dyscrasias exists. It is more common among the children of tuberculous parents than among children who are perfectly vigorous, but it occurs also among those who are apparently perfectly well and robust.

Acute Catarrhal Tonsillitis.—The most common form of the ailment is acute catarrhal tonsillitis. Its attacks usually begin very suddenly and if children are old enough to complain they will speak of the throat being sore prior to any local manifestations of inflammation. Within a few hours of the first symptoms of pain and soreness upon swallowing fever will develop, with or without previous chills or shiverings. Headache, hot, flushed cheeks, suffused eyes and burning skin, with full, bounding pulse, the temperature running up to 103° or 104° , characterize the onset of acute tonsillitis. The tongue is generally coated or furred, white or yellowish. The tonsils soon swell, show to be bright red, and after a few hours present tiny speckings or points about the mouths of their crypts. These may be sufficient in number to coalesce and give the appearance of a tonsillar covering

of yellow exudate. This exudate is very different from that of diphtheria, and the constitutional symptoms of tonsillitis are more acute yet less profound than in diphtheria. The inflammation of the tonsils is more pronounced, and but one side may be affected, usually the left first. In individual cases the speckings not only coalesce but the mucous membrane ulcerates over considerable area of tonsillar surface, the base of which ulceration may be occupied by thick yellow or grayish exudate, very often confused with the diphtheria membrane. In tonsillitis, however, the inflammatory process will be largely confined to the tonsils and the exudation be limited to their surface. It does not spread up into the nares, nor down into the pharynx, nor occupy the pillars of the fauces; nor is there general glandular involvement nor cellulitis to adjacent tissues, nor are the symptoms of systemic invasion nearly so profound as in diphtheria.

It is unlike scarlet fever in the fact that it is not ushered in by vomiting, that it does not have the usual rapidity of pulse of the latter disease and that the erythema which may appear upon the throat and upper part of the chest is very much less pronounced and much more transient than with scarlet fever. The diagnosis of tonsillitis is not over-difficult in most cases, as will have been noted from the foregoing enumeration of symptoms as compared with those of scarlet fever and diphtheria; but it is best that no uncertainty be allowed to obtain in any given case, and to this end careful examination of the neighboring glands, of the pulse, temperature and skin, especially of the chest and neck, should be made. In scarlet fever the rash will always develop promptly upon the appearance of the disease in the throat and in twenty-four hours after the manifestation of acute fever.

Tonsillitis has not the tongue of scarlet fever, the intense red and pointed tip with papillae showing through, the characteristic "strawberry tongue," as it is pronounced, not being present in this disease. Significant differentiating symptoms as they relate to diphtheria are the invasion of the nasal passages, the prompt development of the general glandular enlargement and cellulitis, and the presence of albumin in the urine. Pending the firm establishment of a differentiated diagnosis it is well to treat all cases of tonsillitis occurring in families of children with suspicion, and to insist upon twenty-four or thirty-six hours of isolation of the sick child. Quarantine may be raised immediately a diagnosis of tonsillitis is confirmed, whereas valuable time will have been gained and nothing more than proper precaution will have been taken should the case develop scarlet fever or diphtheria. There is greater likelihood of confusion between the former disease and tonsillitis than between tonsillitis and diphtheria.

SYMPTOMS—As already stated, the acute variety is very apt to be ushered in with sore throat. In some instances instead of

chill preceding the fever there will be intense aching of the limbs, especially the long bones and muscles of the legs and arms, a good deal as manifested in catarrhal fever or in the dengue fever of the South. This aching in adults is sometimes unendurable and very much after the character of acute rheumatism. Besides the aching of the limbs and back there is intense headache, the pulse is full and rapid and the tongue is furred and red at the tip and edges. Examination of the throat will show it to be generally red, with commencing enlargement of the tonsils, one or both. The uvula will be somewhat swollen and relaxed, and the redness will have extended to the pillars of the fauces. The child complains of pain upon swallowing, there is considerable increase of salivation, and because of the fullness of the mouth and throat from the swelling and secretion therefrom speech is altered, the child talking as though the mouth were "full of mush," or with a nasal twang. From the tonsil pains will shoot into the ears, and not infrequently pronounced earache is an accompaniment, especially when one side is involved. With the increase of swelling the fever increases, the child is stupor, drowsy, face intensely flushed and skin hot, dry and burning. Within a few hours of the first manifestations of the inflammation of the tonsils the speckings already referred to show themselves at the mouths of the ducts of the tonsillar crypts, being usually little yellow points, though sometimes white or gray from the start. With the coming of the patches, or the commencement of the ulceration on the tonsillar surface, the pain decreases, it being more acute during the inflammatory stage than during the ulcerative process. All the muciparous glands of the mouth and throat are increased in activity, and occasionally, though rarely, they will have enlargement and induration of the sublingual and submaxillary glands. If the inflammation be superficial the symptoms will subside about as quickly as they came on, and within twenty-four hours of the first manifestations of the tonsillar inflammation superficial ulcers will have formed, the pain will have subsided, the fever will have become less and the child's condition generally will have improved, though it will be left quite weak and considerably emaciated, the brevity of its attack being taken into consideration. If the ulcerations are deep and have affected the tonsillar crypts or follicles, and have taken on the form of follicular tonsillitis, the case is much more profound, the sufferings are more intense, the fever higher, the throat inflammation very much extended and the tonsils themselves so swollen as to meet and almost blockade the passage to the throat. The difference seems to be difference in degree only. Both forms are doubtless due to the same cause. It is the follicular tonsillitis that rheumatism is more apt to develop, and it is believed that it is from the retention of septic matter deep down in the crypts that a great many

post tonsillar diseased conditions, as rheumatism, low forms of fever, chorea, suppuration of the middle ear, dental abscesses and other septic troubles, develop.

Folliculous Tonsillitis.—Acute folliculous tonsillitis is of infectious nature, even when occurring subsequent to the simple catarrhal variety. It is believed that toxination of the follicles is the result of tissue destruction, and directly due to pyogenic micro-organisms resultant upon the acute manifestations of tonsillar catarrh. The inflammation may partake of the character of the simple folliculous tonsillitis, in which there may have been previous inflammation, and which is usually attendant upon tonsils that are hypertrophied. In this connection the tonsil is simply swollen and inflamed, the crypts being occupied by secretions—the products of previous inflammation—that are confined if the crypt openings are obliterated by the degree of swelling. This mucoid secretion breaks down and is squeezed out by the increased swelling, appearing upon the surface as whitish-yellow, cheesy particles, which are often carelessly confused with the isolated speckings of mild diphtheria.

Folliculous tonsillitis is generally due to taking cold or exposure to drafts of air, or to the chilling of the neck following the removal of unnecessary neck wear. This form of tonsillitis is generally mild, painful, attended by considerable swelling, the discharge of the cheesy pellets just mentioned, and prompt recovery. It will not need very much in the way of treatment beyond that of the simple catarrhal form of tonsillitis, but it is frequently necessary to use peroxide of hydrogen or other cleansing agent in water to dissolve away and cleanse the crypts of the secretion which has gathered within, in order to prevent sepsis from this cause. Local steam atomization will often suffice, care being taken not to have it applied so directly and at such temperature as to scald the throat. *Calendula* in water will be found very helpful and is perhaps one of the best applications when used as a gargle, mouth-wash or vapor. *Eucalyptus* is another excellent agent that is exceedingly cleansing and healing. It is especially applicable when the inflammation is more pronounced. Hot carbolized water, one to two hundred, is also an excellent local application.

INFECTIONOUS TONSILLITIS is another variety of inflammation of the tonsillar follicles and is altogether a more serious form than simple folliculous tonsillitis. It is the disease that is so often confounded with diphtheria, and it leads to many extravagant reports of success in the treatment of the latter, as frequently seen in the journals and heard in the societies. It has been called lacunar tonsillitis, ulcerative tonsillitis, gangrene of the tonsil, and infectious quinsy. It also is classed by some authors under the name of tonsillar angina. This form of inflammation of the follicles and parenchyma is unquestionably due to a pathogenic micro-



FIG. 1.
APHTHÆ



FIG. 2.
PERI-TONSILLAR ABSCESS



FIG. 3.
MUCOUS TONGUE



FIG. 4.
FOLLICULOUS TONSILLITIS



FIG. 5.
SCARLATINA



CHRONIC HYPERTROPHY OF TONSILS
FIG. 6.



Plate IV. SYPHILITIC ULCERATION OF TONSILS
FIG. 7.

organism. It may arise in connection with erysipelas or from the streptococcus of that disease. It is caused also by the streptococcus pyogenes and the staphylococcus albus. It is seen in connection with malignant scarlet fever, and it is its presence in connection with this disease that so often suggests the presence of diphtheria and scarlet fever in combination, scarlet fever being unquestioned and follicular tonsillitis giving to it the appearance of diphtheritic complication.

Symptoms and Course.—Infectious tonsillitis is ushered in by a sharp chill, severe aching of the back and limbs, painful sore throat, general enlargement of the tonsils, with deep congestion of their structures, and the early appearance of an exudate about the follicular openings, showing on down into their crypts as far as can be seen. This exudate is translucent, not very thick, is seen about the mouth of the crypts especially, and is so firmly connected with the mucous membrane that it is unwise to practice its forcible removal. The use of sprays is proper in connection with its treatment, but swabbing the throat or forcible attempts at cleansing it of pus and exudate are likely to result in bruising or abrading the tissues and further infection. The parenchyma of the tonsils is very much engorged and they bulge out into the throat, occupying almost its whole calibre. The neighboring lymphatic glands partake of the infection and in special cases are very much swollen. Swallowing is exceedingly difficult and fluids are often regurgitated through the nose. The disease is especially apt to occur in childhood, although it belongs also to early youth and is seen in adult life.

Following upon the chill and aching which have just been described fever rises quickly and is continuous for two or three or more days. The temperature bounds to 103° , 104° or 105° . In some cases headache is violent and delirium presents. The pains are sharp and lancinating, extending to the ears and adjacent glands. The swelling is so great that it is difficult for children to open the mouth to admit of inspection of the tonsils. The breath is offensive, even putrid in severe cases. Albuminuria is seen in some cases, leading to confusion and presenting the suggestion that the process is really a diphtheritic one, whereas such is not the case.

In follicular tonsillitis the membrane does not extend upward into the nares nor downward into the fauces, but is confined to the glands, usually about the mouth of the crypts. Peritonsillar inflammation is not commonly extensive, although in some cases abscesses may form. This disease will run its course easily within a week, during which time the symptoms are acute and violent as they relate to the throat and fever. Muscular pains will generally subside within a day or two, and the fever will subside as the exudate forms on the tonsils. In most cases convales-

ence is as rapid as the outcoming of the disease, while in other cases suppuration of the cervical glands and even general cellulitis of the neighboring tissues may occur as sequelæ, the case dragging for weeks.

Follicular tonsillitis is more often followed by rheumatism than preceded by it. It occurs more commonly in rheumatic subjects, is especially prevalent during cold, damp, winter weather, or in the spring of the year, and in some seasons presents as a considerable epidemic. It usually runs through families, although individual children may escape.

DIAGNOSIS.—The bacteriological diagnosis of this form of tonsillitis as distinguished from diphtheria will depend upon the absence of the Klebs-Loeffler bacillus and the appearance of the various streptococci and staphylococci, depending upon the cause of the infection. It should be borne in mind that it prevails during epidemics of diphtheria, and that recent researches of the New York Health Board and other official bodies show that the Klebs bacillus is often found in tonsillar and even in well throats without diphtheria having been set up. The presence of the bacilli in considerable numbers will give diphtheria the preference. The presence of an occasional bacillus in follicular tonsillitis without profound systemic symptoms will exclude the diagnosis of diphtheria. The diphtheria exudation may commence at the orifices of the crypts just as does the tonsillar exudation, but it does not remain limited to the glands, extending across the throat to the other tonsil and both upward and downward; whereas the exudation of tonsillitis is limited to the crypts of the tonsils and to the mouths of their ducts. It is thinner than the diphtheria exudate, whiter, more translucent, and is not raised above the surface of the surrounding membrane. The exudate of diphtheria is more opaque, soon changing to a yellowish or dirty-gray color, and sloughing and putrifying, emitting more pronounced fetor and being attended by far severer systemic manifestations. The exudate of diphtheria is also continuous, while that of tonsillitis is punctated. If the crypt-ducts are close together these punctata may coalesce and cause a considerable-sized ulceration; but even here the appearance is very different from that of the generally organized exudate of the severer disease. Albuminuria and cervical glandular involvement are almost from the beginning additional symptoms of diphtheria.

TREATMENT.—The treatment of follicular tonsillitis will be more successful and satisfactory if both constitutional and local measures are resorted to. In quite young children, as will be readily understood, it is difficult to cleanse the fauces and very difficult to treat the tonsils, so that in these cases internal medication alone will have to be practiced. But it is no more reasonable to leave the crypts of tonsils which are highly inflamed and show

varying degrees of ulceration blocked with pus and epithelial debris, uncleaned and consequently infective, than it is to neglect a local sore. All subjects of follicular inflammation who are old enough to receive local treatment should have the throat sprayed every three or four hours or atomized with calendulated water, or eucalyptus, or a one to two hundred carbolic acid water, or at least with pure steam, during the acuter manifestations of the disease. These treatments will be very grateful to the little patient, as a rule, and will reduce the swelling and pain by dissolving the pus and assisting in cleansing the crypts. If these are bleeding the swelling is greater, the pain is more severe and the likelihood of systemic infection is consequently increased. Harsh measures should never be practiced, whether in children or adults, but gentle cleansing by the use of medicated vapors will always be found satisfactory in subjects in whom it can be practiced without coercive measures.

Internally the remedies that will be found most useful are those suited to acute inflammation generally, at least in the first degree. *Aconitum*, *Ferrum phosphoricum*, *Gelsemium*, *Veratrum viride*, *Belladonna*, *Guaiacum* and *Apis* will cover the list that will have to be studied for the first twenty-four hours—*Aconitum* for its well-known symptoms; *Belladonna* if the tonsils are very much congested and the throat dry and constricted; *Ferrum phosphoricum* if the tonsils are swollen and raw in appearance, with great pain upon swallowing and high fever; *Gelsemium* if the mouth and throat are unusually dark in appearance, if the face is flushed and swollen, the headache severe, the backache intense and the symptoms of fever and general muscular soreness greater than those relating to the tonsils.

Apis will be called for if the throat is burning and stinging, generally edematous, the tonsils swollen, hot and red out of proportion to the general disturbance.

Guaiacum where there is violent burning of the throat, intense headache, quick formation of abscesses, the taste being exceedingly putrid, and the bodily suffering severe.

Dalmanera is another remedy that will be called for when the muscular soreness and aching of the limbs and back are intense, especially if the case arises from having been exposed to cold or damp weather.

Belladonna will more probably be needed if inflammation is due to sepsis from erysipelas or scarlet fever, while *Carbolic acid*, in the fourth to sixth attenuation, is preferable when the inflammation is from diphtheria or gangrenous infection.

Mercurius bivalentis has been used in routine very extensively and apparently with excellent results; but it is better to differentiate closely and give the one suited remedy than to "shot-gun" at these cases.

Phytolacca is sometimes an excellent remedy in follicular tonsillitis. The tonsils are large, bluish and ulcerated; there is intense dryness of the throat, with burning, smarting, stinging pain in the fauces extending to the ears. The general symptoms of *Phytolacca* are experienced more about the shoulders, neck and upper part of the arms than in the back and lower limbs, as with *Gelsemium*. In this respect it is something like *Belladonna*.

Rhus tox. cures erysipelatous swelling of the throat; yellow appearance of the membrane, especially in the right tonsil; general aching and bruised feeling of the entire muscular system; rheumatism, stiffness and soreness of the joints in connection with the tonsillitis, and rheumatic lameness of the muscles of the neck and throat. Swallowing is difficult and painful, the muscles refusing to respond because of their soreness and stiffness.

Lachesis may be called for when the left tonsil is swollen first, the disease extending to the right later. The secretion from the crypts is unhealthy, and the punctated spots break down into ulcers. The throat becomes stiff and sore upon sleeping, so that it is more painful as the child awakens and attempts to clear its throat from the secretions which have gathered during sleep.

Lac. caninum is especially recommended by Dr. H. C. Allen for inflamed tonsils that are shining and very sore, and so swollen as to close the throat. The throat is edematous, the tonsils are dry at night, the external throat tender to touch, and the inflammation extends from day to day, affecting one side and then going back to the other, and so oscillating. Great dryness of the tonsils at night. I have never used the remedy.

Calcium may be indicated in rheumatic tonsillitis.

Hepar sulphur is called for when suppuration ensues, the pus is offensive, the glands enormously enlarged and breaking down of lacuna between the crypts occurs. *Kali bichromicum* has the herpetic tonsil, the punctata appearing as herpes, not only of the tonsil but showing occasionally elsewhere in the mouth. The exudation is so general as to be membranous. The mouth is full of thick,ropy mucus, the tongue is yellow and the neighboring glands enlarged. *Kali bichromicum* and *Mercurius cyanatus* have been used in cases in which the differentiation between tonsillitis and diphtheria is not pronounced. Other remedies may be called for occasionally, as *Antimonium carbonicum*, *Lycopodium*, *Cantharis*, *Silicis* and *Petroleum*.

Suppurative Tonsillitis.—Suppurative tonsillitis is a form of inflammation of the tonsils and tissues immediately adjoining that is also known as peritonsillar abscess (Fig. 2, Plate IV). To be correct, the inflammation occurs more generally in the surrounding cellular tissues and not in the gland itself; and yet in a good proportion of cases the tonsil is partially or wholly destroyed in quinsy. This is the form of the disease that is called 'speakers'

or clergymen's sore throat, because it so often attends upon public speakers who have taken cold immediately after lecturing or preaching. It is not often seen in children, yet occurs in delicate subjects with sufficient frequency to justify its consideration in this connection. It has much the character of simple acute inflammation of the tonsils; is more often seen in connection with chronic enlargement of its glands, and, as is to be supposed, attacks by preference children who are not robust and in whom some constitutional dyscrasia exists. It is believed that it is caused by infection through decomposition of food particles within the tonsillar crypts, or by the introduction of infective micro-organisms from without the system.

SYMPTOMS AND COURSE.—Peritonsillar abscess, or quinsy, is almost invariably ushered in by a chill. If the exposure was pronounced the chill is likely to be exceedingly severe. Instead of manifestations of acute suffering of the limbs and back there is more likely to be local pain in the throat, usually on one side only. The pain is sharp and lancinating, and extends from the throat to the ear and gland on the affected side. As inflammation proceeds the pain becomes sharper and pulsating in character, and swallowing is very painful. Repeated lancinating pains shoot through the gland and inflaming tissue. The tonsil is swollen and red and the entire throat on the affected side partakes of the inflammation. The swelling extends up into the naso-pharynx and downward as far as can be seen. In severe cases it is so extensive as to almost occlude the fauces; especially is this true where both sides are inflamed. As a rule it is difficult to secure inspection of the throat in children because of the degree of swelling and pain that is present, and even in adults examinations are very unsatisfactory for this reason. The opposite tonsil frequently partakes of the swelling and inflammation, though it is rare that abscesses are present. The uvula and palatine arches are swollen and edematous, adding to the difficulty of swallowing and articulation. There is generally a copious outpouring of mucus from the buccal walls and pharynx and adjacent glands, though in some cases a painful degree of dryness is present instead.

Quinsy is differentiated from simple tonsillitis by the fact that the swelling is much more extensive and is not nearly so confined to the gland. In fact the peritonsillar inflammation exceeds that of the tonsil, whereas in catarrhal tonsillitis the tonsil is the site of the inflammation. It is not easy to differentiate it from follicular tonsillitis, in which suppuration shows itself in the follicles. Up to this time the degree of inflammation is so great that the peritonsillar tissues are also extensively inflamed, but in the follicular form of tonsillitis the crypts of the gland are the pathological site of the disease, and with suppuration from these the swelling and inflammation of surrounding tissue quickly subsides,

unless, perchance, these may have inflamed, when suppuration may also occur. On the other hand, in the disease under consideration the gland is not so likely to suffer as is the cellular tissue in which it is imbedded and by which it is surrounded. In adult life repeated attacks of quinsy occur, and the extent of inflammation and abscess formation is so great with each recurring attack that were each tonsil alone the site of the disease it would be destroyed in a single, or at least in a few attacks. Whereas, as a matter of fact, there is as much of the gland left after repeated attacks of quinsy as at any time in adult life, in most subjects of peritonsillar abscess.

As stated, this affection is generally ushered in by a chill, pain in the throat, heat, redness and swelling of the peritonsillar tissue and tonsils. The temperature rises quickly to 103° , even to 105° . Repeated interchange of heat and chilliness occurs and intense headache is usually present, with swelling to such degree that respiration is very much impeded. Inspection reveals enormous distention of one side of the throat, with pronounced bulging of the cellular tissue in front of the affected tonsil. This is sometimes swollen even with the mucous surface of the gland. It appears red and glistening and within twenty-four or thirty-six hours shows disposition to "point." If it be possible to examine it it will be found to be soft and fluctuating, and by the end of the time named, or within a couple of days at most, the mucous membrane will show yellow spots from the formation of pus and its effort to make its way to the surface. By this time the pain and fever will have materially modified, or will have subsided altogether, and by the time it is demonstrated that pus is present the abscess, inflammation and accompanying symptoms will have quite disappeared.

TREATMENT.—With the first manifestations of acute inflammation of the tonsils *Acute* and *Ferrum phosphoricum* will be indicated—the former if there be chill quickly followed by fever, thirst and restlessness, with headache and intense inflammation of the throat, the pains being sharp and lancinating—*Ferrum Phosphoricum* presenting very much the same conditions that call for *Acute*, yet the cases calling for this remedy lacking the intensity of the *Acute* picture. The throat is sore and the tissues swollen, but the pain is not so sharp and lancinating, nor is the fever so intense.

Belladonna will be indicated if the mouth and throat are hot and dry, the swelling emphatic and on the right side, and if there be unusual pain and difficulty in swallowing, either from the throat dryness or from constriction. The *Belladonna* case suffers severely from headache, and the arteries of the neck, face and head pulsate actively.

Gnoricum is called for if the sensation in the throat is that of burning. The throat is intensely hot and the pain is severe. The

chill is pronounced and there is more aching of the limbs and back than with *Aconite* or *Belladonna*.

As suppuration threatens *Hepar sulphur* will be called for. The sensation is as if the tonsil or its adjacent tissue were being pricked with needles or fish bones. Upon being lanced the tonsil does not heal kindly and the discharge continues for some time.

Apis will be useful if the throat be edematous. Edema of the uvula and palatine veil is extensive, the external swelling of the neck on the affected side is pronounced. *Apis* pains are stinging and biting in character.

Besides these remedies *Mercurius*, especially the *bimiodide*, may be useful in the acute inflammation; nor is it desirable to encourage suppuration by the routine administration of mercurius. The *bromide* and *Belladonna* in alternation, as is so often practiced in acute inflammation of the throat, is never accurate.

Lachesis, *Silicia*, *Gelsemium* and *Rhus tox.* may also be called for in individual cases. Local applications to the neck are sometimes desirable. Flaxseed poultices hasten suppuration, and thus assist in cutting short the duration of the disease. Various medicaments have also been used, as local applications of *Hamamelis*, *Aconite*, *Cannib.*, *Calendula* and certain domestic liniments.

Incision.—As soon as it is seen that pus is forming it is better to incise the mucous membrane in front of the structure of the gland, depending upon the location of the pus, with a small, sharp bistoury, allowing the free escape of the pus into the mouth rather than risking the danger of its burrowing in cellular pockets or remaining confined in the glandular structure. This incision need not be very large, but it should be sufficiently so to allow the free escape of the pus; and unless the abscess promptly empty itself it will be well to inject it by means of a fine pointed ear syringe with a twenty per cent. solution of hydrogen peroxide in order to insure its thorough emptying and prompt healing. For it must be remembered that sepsis very often follows upon abscess of the tonsils or peritonsillar tissues, with acute articular rheumatism as a result.

Strumous children, the subjects of recurring attacks of tonsillitis or peritonsillar abscesses, will need constitutional treatment extending over a period of time, with such remedies as *Aracnium*, *Coccaria*, *Baryta*, *Phosphorus*, *Sulphur*, *Thuja* and others, according to individual necessities, together with nourishing diet, and, if necessary, the addition of carbonifying foods, as cod-liver oil, petroleum-emulsion, and other, especially nitrogenous diet.

CHAPTER LXXI.

CHRONIC TONSILLITIS.

General Considerations—Symptoms and Course—Treatment—Medication.

General Considerations.—Children may suffer from chronic enlargement of the tonsils without having had attacks of acute inflammation of these glands, their cases coming under the head of chronic hypertrophy. As a rule, however, children who suffer considerable enlargement of the tonsillar glands have been the subjects of repeated attacks of acute inflammation which have usually gone on to suppuration. The enlargement is sometimes so great that the tonsils completely occupy the pharynx, interfering with the natural breathing process and resulting in considerable deformity to the upper part of the thorax from this cause. The disease is really an overgrowth of the glandular tissue of the tonsils, in some instances the gland presenting as an irregularly shaped body reaching clear across the pharynx and crowding against its fellow on the opposite side until both are considerably flattened. (Fig. 4, Plate IV.) In rare cases they increase in the vertical direction, occluding the nasal pharynx. In other cases the tonsil presents as a smooth, ovoid body, its membrane being intact and its glandular structure quite firm. Again it will be seen to be nodular, its tissues so soft as to be readily compressible. Hypertrophied tonsils are usually pale in color, although occasionally they present a reddened appearance, and in florid subjects show a good deal of vascularity, bleeding excessively upon amputation. Where they are rough and nodular the very irregularity of their throat surface tends toward the lodgment of articles of food in the crypts, and thus they become the seat of local sepsis.

Symptoms.—Hypertrophied tonsils are not attended by pain or suffering. The chief symptoms arising from their presence lies in the direction of obstructed breathing and interference with proper vocalization. The voice is usually thick and enunciation indistinct. Mouth breathing is made necessary by the encroachment upon the posterior nares if the tonsils are greatly hypertrophied. As a rule with tonsillar children sleep is restless and disturbed, because of the interference with normal breathing and the amount of buccal and pharyngeal secretion arising from the presence of hypertrophy. If the enlargement be great malformation of the upper portion of the chest is apt to result. The pigeon-breast is seen in children having chronically enlarged tonsils, and a certain degree of dwarfing of the chest, or in fact of the entire child, is often the result of chronic hypertrophy of the tonsils it

is associated with it. Naturally, tubercular or rachitic children are more prone to this glandular enlargement than those of robust habit. But doubtless the imperfect oxygenation of the blood, the result of the attendant interference with normal breathing, has to do with the lack of proper development of the subject.

The symptoms vary in individual cases. Some children seem to suffer no inconvenience from the tonsils that are greatly enlarged. In others repeated attacks of acute or sub-acute tonsillar inflammation attend upon hypertrophy of the glands, and with each succeeding attack they develop more than before. Nearly all subjects of chronic hypertrophy have naso-pharyngeal catarrh; dyspeptic complications are also common, probably because mastication is imperfectly performed. If the tonsils be repeatedly subjected to sub-acute inflammation rheumatism is more or less constantly present, especially during very bad weather and in the spring of the year. The disease is seen at almost any age from infancy to puberty, and occasionally is witnessed in adult life. The subjects of enlargement are usually scrawny and ill-nourished, as is the case with most glandular children. The tonsils may remain enlarged a number of years and decrease in size to or below normal under proper treatment, or with the general improvement of health. In most children chronic hypertrophy is cured by the coming of puberty. In others they are increased at this time and give more trouble than before.

Not only are the tonsils usually enlarged in children who have been repeatedly subject to acute inflammation of the glands but they are very often severely indurated. When induration is present they are more likely to be smooth and even in form and impart a sense of firmness to the touch, showing as hard lumps on either side of the pharynx. With enlargement of the tonsils the uvula is generally elongated and enlarged, and the "throat" or "stomach cough" peculiar to children is present. Children of tubercular parentage with enlarged tonsils are quite disposed to develop phthisis toward the end of the second decade of life. In these subjects the tonsils appear honey-combed, from rupture of their follicles, or because the lacunæ have become enlarged from congestion and inflammation (Fig. 6, Plate IV). In some cases the tonsils are not only pale but may appear ectaceous and be studded here and there with particles of cheesy secretion that cause both local and constitutional infection.

Very young children with chronic hypertrophy of the tonsils are almost certain sufferers constitutionally, and very natural is it that this should be so. Normal breathing is out of the question and normal feeding is not easily accomplished. Their lips become thick and their features more or less distorted, because of difficulty in breathing and eating, and if the enlargement be considerable and oxygenation and nutrition be very much interfered

with the child will show emaciation and general disturbance of the system.

Treatment.—Some physicians boast of having removed tonsils by the scores, even hundreds. Bosworth goes so far as to say that the real hypertrophic tonsillitis is never cured except by excision. Ashby follows in the same trend in suggesting that the only efficient mode of treatment is by removal. Other surgical methods have been employed, with varying success, as destruction of the glandular tissue by hypodermic injection of crude carbonic acid directly into the body of the gland, the application of the actual cautery, or the topical application of sharp escharotics. For their removal many devices have been invented, and different surgical proceedings have been practiced. These will be considered in their proper place among the surgical diseases of children.

The author is not ready to admit that surgical measures are required in any considerable proportion of cases of hypertrophied tonsils. It is not believed to be necessary to remove them except in extreme cases, no more than it is to dissect out large glands located elsewhere. The tonsils are physiological organs and have a function to perform which is altogether their own. The very intimacy of their association with the sexual glands is sufficient to sound a note of warning against indiscriminate amputation. Excision is demanded in rare extreme cases just as excisions of the ovary, thyroid or testicle, or other glands, may have to be performed. It has been my rule to save the tonsils whenever possible, and by careful application of the properly indicated constitutional homeopathic remedies I have been able to succeed in this direction in many cases where failure seemed certain. Especially in young children is excision rarely if ever justifiable. In older children, who have already developed the sexual glands and who are approaching the age of puberty, it may be permissible if the tonsils have withstood intelligent efforts at reduction by medication. As has been shown, the condition is almost invariably due to constitutional dyscrasia. The removal of tonsils does not influence these dyscrasias in the least, whereas their unnecessary removal may, and often does, result in metastasis of constitutional tendencies to other glands. I am quite sure I have known tonsillar subjects whose glands have been amputated, as I believe unnecessarily, to develop tuberculosis of the bronchial glands and lungs. Just how far the phthisical developments depended upon the amputation is not, of course, clear; but the association has seemed sufficiently direct to prompt the author to perform excision in extreme cases only.

MEDICATION.—The remedies most useful in tonsillitis are those whose base is iodine, as *Iodide of Arsenious*, *Iodide of Baryta*, *Iodide of Calcearia*, *Iodide of Potash* and *Iodide of Mer-*

cary. Of all these I have found the *Iodide of Arsenicum* the most beneficial, doubtless because it reaches the constitutional state of the patient as well as the glandular enlargement. The tonsil is enlarged and indurated. The child is unevenly developed. Emaciated limbs with well developed trunk, head large, small neck, abdomen distended. In children of tubercular habit or of rachitic dyscrasia, in whom hypertrophied tonsils are seen, this remedy is especially useful.

Baryta pulata has hypertrophy of the tonsils with long-continued chronic enlargement and an unusual degree of induration; the adjacent lymphatic glands are swollen and the child is a glandular subject in general. The *Barytas* seem more especially indicated as the child approaches the age of puberty. *Baryta carbonica* is better adapted to acute cases of tonsillitis than to tonsillitis in subjects of repeated suppurations, while the *auriata* is more especially adapted to a chronic catarrhal condition involving not only the tonsils but the larynx, with hoarseness of the voice, difficulty of swallowing and moderate induration of the tonsils.

Calcarea pulata is applicable to tonsillitis in the *Calcarea* child. The tonsils are very much enlarged and filled with little crypts or pockets containing cheesy matter. The differentiation between the iodine combinations will be best made upon the constitutional states.

Mercurius proto-iodide has been found especially applicable to children suffering with hypertrophied tonsils combined with chronic post-nasal catarrh, the tonsils tending to repeated attacks of superficial ulceration.

For acute irritation of hypertrophied tonsils *Apis*, *Belladonna*, *Ferrum phosphoricum*, *Kali bichromicum* and *Mercurius benzoide* will be required.

Guaicureu is also an excellent remedy in this connection and promptly exhibited in the cases whose throats burn violently and in whom abscesses are threatened will often abort them. *Hepar* will be needed for suppurative ulcers or abscess formations in and about the tonsils, with a general unhealthy condition of the peritonsillar tissue. *Silicæ* is applicable to deep ulcers of the tonsils; continued suppuration from these other glands. The tonsils are so swollen that efforts at swallowing bulge the neck and distort the face. *Rhus tox.* and *Septa* are applicable to cases associated with or attendant upon the rheumatic disorders. I have found *Septa* to be the best single remedy in the post-tonsillar rheumatism of septic origin, while *Rhus* has most often met the rheumatic inflammation of the throat in tonsillar subjects, and sore throat appearing upon changes of the weather and more especially upon exposure to dampness or cold rains.

CHAPTER LXXII.

RETRO-PHARYNGEAL ABSCESS.

General Considerations—Symptoms and Course—Treatment.

General Considerations.—Retro-pharyngeal abscess results from inflammation of the lymphatic glands of the posterior pharyngeal wall. It is of the character of phlegmonous inflammation in the lower pharynx, developing into abscesses with suppuration, and is supposed to be due to micro-organism infection occurring from without the body, or from destruction of tissue in which bacteria already exist. It occurs most often in lymphatic children, those of the rickety type, and it is quite likely that the infection is introduced through the pharyngeal lymphatics from the tonsils or post-nares. It is seen in tuberculous children, occurring most often in subjects of putrid nasal catarrh, recurring tonsillitis, or suppurative destruction of the glands of the neck. It may follow upon mumps, though rarely; is seen after diphtheria and scarlet fever, although it most frequently occurs independently of either of these diseases. It has been held that retro-pharyngeal abscesses are due to caries of the vertebrae or the occipital bone. Dupuytren treated of them in this connection and earlier surgeons all looked upon them as directly due to vertebral caries. Bosworth records an analysis made by Bokia, of Vienna, of two hundred and three cases in which it is shown that one hundred and seventy-nine occurred idiopathically, seven were the result of abscesses burrowing from the neck, seven occurred as secondary to bony diseases, nine were the result of scarlet fever or measles, and one occurred from traumatism.

It will thus be seen that by far the larger number of cases occur without relation to acute infectious diseases. As a rule they are seen in young children, but may belong to adult life.

The processes consist of a local inflammatory action from constitutional or local infection occurring in the lymphatic tissues of the pharynx, these breaking down and suppurating. The abscess usually forms on one or the other side of the lower part of the pharynx, although it is occasionally manifest directly in the center. Usually it can be seen from the mouth and is visible extending below the border of the soft palate. It may extend downward into the esophagus, and the pus has been known to open through the tissues of the neck at the level of the clavicle.

Symptoms and Course.—As it occurs in children retro-pharyngeal abscess comes on very insidiously, as a rule. It is notably common in those children of glandular diathesis, and, as

has been shown, the course is a good deal that of inflammatory suppuration in the cervical region. The child suffers loss of appetite, is restless, salivary, loses flesh, and presents hard cough and throat symptoms, as fullness of the throat and increased mucous secretion, but it does not attract attention to any particular disease. As the case progresses speech becomes affected by the swelling of the throat much as occurs in the first stage of quinsy. Swallowing becomes painful and is often rendered impossible. If the child is nursing it refuses the breast, or takes it and gives up with a cry of pain. Children who are older refuse food altogether and manifest great pain upon efforts at swallowing. If the swelling increases rapidly and attains considerable size respiration will be interfered with and breathing be rendered difficult. Inspection of the throat shows tumefaction well back in the pharynx without unusual inflammation or redness, unless the case has come on much more acutely than is common to this disease. If of traumatic origin, or immediately resultant upon some acute inflammatory process, symptoms of acute inflammation will show more pronounced; but occurring as a sluggish process the tumefaction is out of proportion to the inflammation present. As the abscess increases in size swallowing becomes still more difficult, the voice more muffled and breathing more interfered with. It may be a week or ten days from the first manifestation of abscess-formation before the condition is clearly diagnosed. It is to be differentiated from edema of the glottis by the fact that the swelling is in the pharynx and not in the larynx. Furthermore it occurs on one side of the median line. Inspection with the finger or small probe shows tumefaction. The bulging portion of the abscess presents a hard red surface, somewhat whiter at the point at which the pus is trying to escape. In cases presenting as phlegmonous inflammation the surrounding tissues are much enlarged and swollen, deep red in color and very hot and dry. The impairment of voice differs from that of cold or lung affection in that it is mushy instead of hoarse.

Retro-pharyngeal abscess runs its course in from one to two weeks. Pus forms throughout the entire affected area and if allowed to remain confined results in auto-infection, impairing the tissues and glands and oftentimes resulting in general cervical inflammation.

Treatment.—Retro-pharyngeal abscess is only dangerous when overlooked or neglected. Pus may burrow into brain tissue, burrow down in the esophagus, work its way through the cellular tissues and lymph cells of the neck, open below the clavicle and even find its way into the larynx, lung or mediastinum. Occurring in young children it may be gravitated posteriorly and instead of being caused by caries of the vertebrae it may set up periostitis and bring about this very condition. If the swelling is allowed to go on to enormous proportions a dangerous degree of dyspnea may

result. Cases are reported in which tracheotomy has been necessary.

The surgical treatment of retro-pharyngeal abscesses lies in their incision. This should be made as near the median line as possible, and care must be taken not to injure the larynx nor to incise unnecessarily deep into the cervical tissues. The child's mouth should be well open, its tongue depressed and an incision made through the most conspicuous part of the abscess, the child's head being at once lowered in order that the pus may escape and not run down into the larynx or trachea. If the abscess is large the amount of escaping pus will be surprising, especially if burrowing in the surrounding tissues has taken place. In the very nature of the case but little can be done in the way of local treatment; but in cases that do not heal promptly and where sinuses form the abscess may be washed out with peroxide of hydrogen.



FIG. 68.—Characteristic position in Retro-pharyngeal abscess.

Constitutionally *Hepar sulphur*, *Belladonna*, *Mercurius*, *Silicia* and *Arsenicum* may be required, each for its well known symptoms and conditions; *Hepar* or *Mercurius* to hasten suppuration; *Belladonna* or *Apo mellifica* to allay surrounding inflammation and edema; *Silicia* or *Calcarea* in glandular subjects with slow healing and protracted suppuration; *Arsenicum*, *Lichen* or *Rhus tox*, in erysipelatous conditions with pronounced brain and systemic disturbances.

Nourishing food and, especially, nitrogenous preparations may have to be given to insure prompt convalescence and complete recovery.

CHAPTER LXXIII.

SPASMODIC CROUP.—LARYNGITIS.

General Considerations.—Definition.—Symptoms and Course.—Diagnosis
—Treatment.

General Considerations.—Croup is variously treated of under the names of catarrhal laryngitis, spasmodic laryngitis, pseudo-croup, false croup, laryngitis stridulous and membranous croup. Some of these names are misnomers. A child may have a violent attack of spasmodic croup without inflammation of the larynx or catarrh of that organ, and thus the names catarrhal laryngitis and acute laryngitis be misleading. For practical purposes it is sufficient to divide croup into two classes, false croup and true croup, false croup signifying laryngitis stridulous or spasmodic laryngitis, from whatever cause; true croup or membranous croup signifying the existence in the larynx of a false membrane very much like that of diphtheria and among many authors accounted a diphtheritic membrane, the disease being classed as laryngeal diphtheria.

Definition.—Laryngitis stridulous is the form of croup commonly observed in young children as an attendant upon acute colds. It occurs at all periods of child-life, but is more commonly seen between the second and fourth years. In rare cases children a year old may have spasmodic croup, and even up to the fifteenth year children suffer from it; but by far the larger number of cases occur between the second and fourth years of child-life. While it attacks children of all physiques yet it is more commonly seen in robust children with short, thick throats and plump muscular systems, this type of children being commonly adjudged by the laity to be the croup subject. Boys are more subject to the disease than girls, though this may be because of the difference of their habits.

Spasmodic croup is usually met with as a purely idiopathic affection coming on without reference to the constitutional state of predisposition to other disease. It is most commonly seen in the cold months, especially in the spring of the year as winter is breaking. Its especially excitant factor is exposure to draughts of air or to the child's getting its feet wet or sitting on the snow or damp ground. Sudden changes of the temperature of the sleeping room will also start the spasm, and children are sometimes thrown into paroxysmal spasms by throwing the covering off in the middle of the night while perspiring about the neck and chest. It may also supervene upon violent crying spells, during which the child is heated and caused to perspire about the neck and throat, dropping off to sleep through exhaustion and relaxation from its efforts at

crying only to take cold upon being relaxed and to awaken in an attack of spasm of the larynx. It is recognized also that children who have once had an attack of croup are likely to have it again. Some subjects have repeated attacks until they "outgrow" it. I have met a number of cases in practice in which persons who were subject to severe attacks of croup in child-life remained subject to it throughout early adult-life. Two or three of the worst attacks of croup I have ever seen were in young adults who were very subject to it when children.

Symptoms and Course.—Spasmodic croup comes on suddenly, as does almost every other spasm. The child may be perfectly well during the day and evening and waken in the middle of the night gasping for breath, clutching at its throat, laboring violently to get sufficient air to sustain life, the larynx being contracted in spasm, reduction of its caliber causing labored efforts at inspiration, each breath being attended by the loud crowing sound which gives to the disease its name. If associated with catarrhal inflammation the attacks may become severe, even dangerous. The main features of the disease are the altered cry, the coarse whistling sound upon respiration, and difficulty of breathing. In some cases croup is preceded by hoarseness which may be slight or pronounced. Rarely aphonia is present, especially if croup is excited by crying, during which hoarseness is set up. If the child is old enough to explain its feelings it may complain of a burning or of a tight, contracted sensation in the larynx or trachea. The child is not apt to cough, though in some cases there is a dry, sharp, explosive cough. There is usually more tendency to cough before the spasm comes on and as it disappears than during it. All efforts are centered at this time toward getting breath, the severe muscular efforts of the child in throes of a severe case of spasmodic croup being distressing to behold. The chest will heave, the neck muscles be rigidly drawn, the features distorted, the surface more or less cyanosed from lack of free blood-oxygenation, and the picture be one of dire distress. Even after the child has become exhausted from these severe efforts at breathing the hoarse, whistling respiration may continue.

In some cases, especially those depending upon an attack of acute croup, there will be a sharp rise of fever as the croup is coming on. In rare cases there may have been a positive chill or chilly sensations followed quickly by fever, the croup continuing upon these symptoms, in which case it is dependent upon catarrhal inflammation of the laryngeal mucous membrane. The course of croup with fever in the case is much the same as those cases in which there is no fever, but there is added to the danger the possibility of convulsions from a super-heated and imperfectly oxygenated condition of the blood. Fortunately spasms are not

often seen in association with croup, nor is fever a common attendant upon it; though fever may result later as bronchitis or catarrhal pneumonia develops, as is sometimes the case in association with croupy or catarrhal laryngitis.

Ordinarily an attack of spasmodic croup is soon through with; but if left alone it may drag out its course over two, three, or four days, with recurring attacks of spasms of the larynx, especially at night, and more particularly in the latter part of the night. Under prompt homeopathic treatment it is a simple ailment, and while very distressing while it lasts ought never to be fatal.

Diagnosis.—The diagnosis is easy. The suddenness of the onset, the hoarseness, peculiar crowing respiration, coarse, croupy cough, when cough is present, the distressing efforts at breathing, and the absence of evidences of acute infectious fever or other acute disease of childhood will quickly make the diagnosis clear. It is only necessary to differentiate it from tracheal diphtheria and non-specific membranous croup. It is not likely that it will be mistaken for the former, and as will be seen from the description of membranous croup there are distinguishing features which should make its differentiation from the latter disease easy and complete.

Treatment.—The treatment of spasmodic croup is simple. If it results from exposure to raw damp air, to winds from melting snow, from getting the feet cold and wet, from sitting on the cold, damp ground, or from like cause, coming on suddenly with or without fever, but especially with febrile reaction, *Aconite* is almost a specific. The child will be restless. Its pulse is accelerated, its expression one of distress, and the hoarseness and coarseness of its cough and cry clearly indicate hyperemia of the laryngeal membrane. If *Aconite* does not promptly relieve the symptoms and if there be absence of the *Aconite* heat and restlessness *Ferrum phosphoricum* may be administered with confidence.

Belladonna is more suited to the congestive type of case. The spasm of the larynx will be distressingly severe, the child frantically clutching at its throat, so desperate will be its efforts to catch its breath. The case comes on suddenly and is alarmingly violent. The hands and feet are cold and the face and neck cyanosed. *Aconite*, *Ferrum phosphoricum* or *Belladonna* will meet nearly all cases in the congestive or inflammatory stages.

Spongia is almost a specific for the hoarse, croupy cough of laryngismus stridulous. The cough is so hoarse that the voice sounds unnatural, and in efforts at respiration the same coarseness is heard. The cough sounds much like the noise of sawing through a board. The breathing is hoarse and dry, without mucous rattling and is somewhat relieved by elevating the head and shoulders.

Hepar sulphur is useful for rattling, choking, croupy cough coming on in the early hours of the morning or worse at this time.

Rattling of mucus in the throat. The child chokes during coughing spells.

Sanguinaria.—Hoarse, croupy cough, with dryness of the throat; wheezing, whistling, tormenting cough. I now use *Sanguinaria* where I formerly used *Spongia* and *Kali bichromicum*, seeming to get better results from it than from either of these remedies; but the cough must be dry and hoarse and attended by the whistling and wheezing spoken of.

Kali bichromicum is better suited to membranous croup and will be discussed in that relation.

Sambucus is indicated in severe attacks of croup coming on just after midnight; wheezing, crowing breathing, with suffocative attacks and fear of suffocation. Better when perspiring and relaxed. Mucous rales in throat and chest; desire to remain covered and to be kept warm and moist. Symptoms aggravated by becoming chilly. *Sambucus*, *Hepar sulphur* and *Tartar emeticum* are very much alike.

Bromium.—*Bromium* is especially adapted to cases that are preceded by hoarseness and aphonia, and in which the spasm of the larynx is severe. The child desires to be carried from room to room, and so great is the suffocation that it gasps for breath.

Bromium and *Sanguinaria* are very much alike in their relation to croup.

In domestic practice and in old school treatment *Ipecac*, *Spirits* and other emetics are used with the idea of producing relaxation of the system and thus overcoming the spasm. An old-fashioned domestic remedy is alum and honey, and in country practice it is quite the rule to administer a teaspoonful or more of hot lard internally and also to apply hot lard over the throat. It is also the rule to tightly close the room and keep it vaporized with steam from boiling water, and to apply cloths wrung out in hot water over the child's neck, even to give it a hot bath during the violence of the spasm. Another domestic measure in the South and Southwest is the application of tobacco leaves over the throat, securing relaxation and nausea by this means. None of these measures are needed in association with homœopathic treatment. In the earlier years of my experience spasmodic croup was my *À-cé-voir*, and I have ridden in the middle of the night from one to a dozen miles post haste to see a child with spasmodic croup who would obtain relief upon the administration of two or three doses of *Aconite*, *Sanguinaria*, *Belladonna*, or *Kali bichromicum* as indicated. In later years when quite certain of the diagnosis of spasmodic croup it has become my rule to send to these patients two or three of the most clearly indicated remedies by the messenger giving the description of the case, with explicit directions for their use, one at a time; and it is not often necessary thereafter to call upon a croupy patient. It will be well to caution

the beginner that this course is never justifiable if diphtheria is prevailing in the neighborhood or if the case has been slow in its onset. It is only permissible when the history is clearly that of spasmodic croup, even then it being better, if other pressing engagements are not on, to see the patient unless the description given by the messenger be clear; for it is much easier for the physician to make his prescription upon what he may see and the sound of the cough and respiration than to interpret the case from others.

CHAPTER LXXIV.

MEMBRANOUS CROUP.

General Considerations—Symptoms and Course—Diagnosis—Prognosis—Treatment—Diet and Hygiene.

General Considerations.—True croup is now considered to be diphtheria of the larynx. It offers danger to life by mechanical obstruction to respiration. While occurring idiopathically it also occurs in association with measles, scarlet fever, rotheln and perhaps other acute diseases, or as a sequel to them. False membrane is also formed in burns from steam and certain irritating chemicals or drugs, but the membrane in these cases is not, of course, the result of a disease process.

Membranous croup most frequently attacks children between the ages of two and seven. It has also been seen earlier and occasionally later; but from five years of age on the danger is very greatly decreased over the three preceding years. If it be due to diphtheria it is not likely to be confined to the larynx but involves the bronchial tubes and trachea as well. In special cases the inflammation of the membrane may begin below and proceed through the trachea upward, affecting the larynx as it proceeds. It has long been an open question as to whether there be a distinct form wholly independent of diphtheria. Most authors believe in the diphtheritic relation, and go so far as to suggest that the diagnosis of membranous croup means unrecognized diphtheria of the larynx or trachea; but this opinion is not sustained by the majority of observers, Virchow, Billroth, Wagner and others having described the idiopathic differences between croup and diphtheria. They contend that the film consists of a fibrinous exudation deposited wholly on the mucous membrane, while in diphtheria the exudate penetrates the meshes of the membrane and results in a localized gangrenous process of necrosis. Bosworth holds that

the two diseases are distinct, but suggests the possibility of there being a certain definite relation. The clinical symptoms of membranous croup and tracheal diphtheria are practically the same, though the pictures presented are very different. The diphtheritic process begins in the mouth and upper throat and extends downward, involving the larynx and trachea immediately. Here there will be the general picture of diphtheria plus the obstruction to breathing due to invasion of the windpipe; but in typical tracheal diphtheria the child perishes from suffocation prior to the development of general sepsis with but profound constitutional evidences of diphtheritic blood-poisoning. In comparison with diphtheria membranous croup, or membranous laryngitis, which is the more proper name, is a rare affection. I have seen but two typical cases in twenty-three years of practice. It is due apparently to the same causes that excite attacks of spasmodic croup, yet it is not reasonable to suppose that its fatal manifestations—the occluding membrane that forms on the surface of the larynx and trachea—can arise without specific causation; there must be something more than the simple portious of catarrhal inflammation of the lining of the membrane, though as yet no individual micro-organism has been separated as the special germ of the disease. It is quite likely, however, that the individual micro-organism finds its way to the mouth and throat and takes lodgment in the lymphatics of the fauces, there to propagate and excite the inflammatory process which results in the fibrinous exudation that occludes the wind pipe. Bosworth is of the opinion that a croupous deposit in the fauces is of the form of acute follicular tonsillitis; but a croup membrane on the tonsil is to be regarded as presenting a certain amount of danger of the same process developing in the larynx. The germ that gives rise to acute follicular tonsillitis is a feeble one, and its action is limited to the exudation in the crypts of the tonsils. The same germ in the more active state is held to give rise to a fibrinous exudate that covers the face of the tonsils as well as the crypts, and Bosworth holds that it is this microbe that produces the membranous deposits in the larynx; that no croupous deposit in the fauces which is croupous and not diphtheritic is attended by danger of the development of a similar process to that in the fauces farther down the throat. No matter whether this theory be correct or not it is a clinical fact that cannot be gainsaid that membranous laryngitis may destroy a child in a family of children or public institution without other cases developing, and this could hardly be the case were it a diphtheritic disease. It may be difficult to differentiate it from tracheal diphtheria in individual cases, and it is not impossible that it may be associated with facial diphtheria, but it is equally true that it occurs idiopathically and is deserving of consideration as a separate disease. Just as we have membranous tonsillitis

that is not diphtheritic so we may have membranous laryngitis that is not diphtheritic.

Membranous croup may come on in a child who is apparently perfectly well, but it has a preference for throat subjects; that is, for children who are liable to repeated attacks of simple tonsillitis, follicular tonsillitis, pharyngitis, nasal catarrh, and those who are generally non-resistant. It may have as exciting causes all the conditions that excite tonsillitis, as taking cold, sudden suppression of perspiration, getting the feet wet when heated, draughts of air upon the neck and chest while sleeping, radical changes in the neckwear during inclement weather, and other similar circumstances which serve to excite the inflammatory process. It also follows upon severe crying spells in young subjects, in whom the mucous membrane of the larynx congests and more easily takes on inflammation. It is likewise incited by unusual efforts of the larynx in other directions, as excessive and strained use of the voice while at play, in singing, and other vocal exercises.

Symptoms and Course.—Membranous laryngitis is generally preceded by a simple inflammation, or at least irritation of the laryngeal membrane. Its onset is slow, requiring from five to ten days to reach the climax of a positive attack of membranous croup. There will be more or less general malaise, fretfulness, irritability and irritation of the throat. The voice becomes husky, and it will be noticed that the child is a little hoarse and coughs occasionally, the pertussis being deep and guttural. Gradually the breathing becomes somewhat difficult; or the initial symptoms may be present some days without its being noticed that the child is having difficulty in breathing, an unusual degree of hoarseness and perhaps more or less loss of voice being all that attracts attention. The voice may be lost at the start, and efforts at talking and the explosions of coughing be painful, causing the child to cry, which also hurts it. The cry is altered in character, being hoarse and pitiful. Because of the pain attendant upon efforts at speaking, and crying and coughing these will be refrained from as much as possible. After perhaps two or three, or even four or five, days of this history the breathing becomes difficult. The child breathes with its mouth open, the breath is long drawn, with occasional sighing respiration, and it will be noticed that the muscles of the chest are brought into play in getting its breath, with strident crying or hissing inspiration. It will also be observed that the larynx moves up and down the throat farther than usual in efforts at inspiration and expiration. The breath gradually becomes more and more altered, the veins of the neck become extended, the extremities, and perhaps the face, cyanotic. The child tosses about the bed and frequently changes its position, trying to get relief. In desperate cases it grasps its throat, its eyes become distended and its facial expression is that of dire distress. The skin

grows turgid and the head and upper part of the neck are bathed in perspiration, so severe are the efforts at breathing. In certain cases there will be times of relief, extending over an hour or two, more especially in the warmer parts of the day, while in others the progress of obstruction to breathing is steadily continued. In the worst cases the child becomes fairly frantic as suffocation becomes more pronounced. The face then grows pallid, cold and pale, and the surface is covered with cold, clammy sweat. Prior to this collapse the child may have been frenzied, grasping frantically at the attendants, overwhelmed with fear, and, if old enough to appreciate the situation, fully conscious of its increasing danger and wholly conscious of its helplessness. With the collapse comes apathy, shallow respiration, loss of muscular effort, increase of cyanosis; carbonic acid poisoning is fairly on, the child sinks into stupor, coma and death.

Individual cases may not present so severe a picture as this. The inflammation may be of the milder type and the child may be hoarse for a week or two before it becomes aphonic. The cough is not usually severe, nor unusually hoarse and dry, the violence of the paroxysms comes on suddenly in the night or early morning; it may be that the obstruction to breathing has been so gradual that the pail on the vital forces has not been severe, though severe enough that when the struggle comes on the child will quickly become unconscious or cyanosed and cadaverous. It may have been well when retiring, to waken in the throes of death or not waken at all, going off into unconsciousness, stupor, coma, and dissolution, with but a brief period of suffocation and suffering.

Examination of the throat reveals it to be hyperemic and swollen, probably with fibrinous exudation in flakes and spots on the fauces or glottis. In severe cases, if a very thorough examination of the throat is possible, a false membrane may be seen. It is the swollen occlusion of the larynx that is especially significant. The ventricular walls are enlarged, the vocal cords pink or quite normal in color, and beneath them can be seen deep red or purplish rounded masses of tumefied tissue, bulging at a point above the line of the cords, narrowing the glottis down to a simple fissure. A mucopurulent secretion may be collected about the tissue, increasing the occlusion. The blood vessels are swollen and tortuous and the general phenomena are those attendant upon catarrhal inflammation, causing an exudation of sero-fibrinous character, which in slow and severe cases becomes an organized exudate.

Diagnosis.—The diagnosis of membranous croup needs only to be differentiated from diphtheria. In the latter disease the membrane is thin, yellow and efflorescent, and is closely allied to the parts beneath. Efforts at its separation result in bleeding of the tissues below, and within a few hours from the time of its

appearance evidences of necrosis, as putridity of breath—even to unusual fetor from the mouth and throat—will show. The constitutional symptoms are more profound, there being greater elevation of the temperature and the existence of albumin being usually discoverable in the urine. Furthermore, the microscope and culture tube will settle the question in the vast majority of cases.

The membrane of croupous laryngitis is bluish-white in color, thin and but slightly raised above the parts beneath it. It is a membrane on the mucous membrane, while the deposit of diphtheria is a membranous exudate of the mucous membrane, delving down into the meshes. The membrane of croup does not become necrotic, and if it is typically true it separates without causing bleeding. In special cases it is thrown off as a complete cast of the larynx or trachea, while such, of course, is exceedingly rare—if indeed even possible—in diphtheria, the membrane of the latter being too firmly attached and deeply interwoven in the tissue. If the membrane is thrown off in necrotic state this will determine its diphtheritic character. It is then yellow and putrid, and beneath it will be found pus and considerable masses of epithelial debris. The presence of the diphtheritic process in the mouth and fauces makes the preponderance of evidence in favor of diphtheria. It is not believed that it is possible for the larynx and trachea to become occluded with the membrane of diphtheria without its being discoverable in the throat. It will require such a length of time for a membrane that will smother a child to death to form that the process is almost certain to invade the fauces, and if in any given case at the end of twenty-four or thirty-six hours, at most, there are not present evidences of localized tissue-necrosis it may be put down that the disease is membranous croup. Furthermore, by this time, if it be diphtheria, the evidences of constitutional infection will be sufficiently profound for there to be but little difficulty in reaching the diagnosis. It is essentially the insidious cases whose onset drags over a number of days without attracting attention, only to burst forth in a single night into a fatal blossom, that cause confusion.

While there is nothing especially characteristic in the temperature of croup or diphtheria yet in the latter disease it partakes more of the nature of the range belonging to sepsis, while in the acute membranous it may quickly open, in the first struggles for breath, in the form of sharp fever, registering a temperature as high as one hundred and four and one hundred and five during the period of its greatest intensity. These circumstances, coupled with the history of a primary cold, non-exposure to diphtheria and the absence of all possible evidences of diphtheritic exudate in the upper throat, will go far toward making the diagnosis of membranous croup a correct one.

The differential diagnosis between croup and diphtheria is quite clearly shown in the following comparison by Morse in *Arndt's System of Medicine*:

CROUP.	DIPHTHERIA.
Asthemic and local inflammation.	General and asthemic inflammation.
Not contagious.	Contagious.
Larynx is affected first.	Palates and nares first invaded.
No paralysis.	Paralysis often follows.
Sporadic usually.	Usually endemic or epidemic.
Rarely attacks adults.	Frequently attacks adults.
Arises via inhalation.	May be without exhalation.
Fatal by stenosis.	Death without impediment in respiration.
Not inoculable.	Inoculable.

To this comparison may be added the additional emphatic diagnosis of respective non-infectivity and positive infection of croup and diphtheria, as shown by the quick action of the Klebs-Löffler bacillus in the culture tube, and the positive evidences of its existence in considerable colonies as shown under the microscope. Excepting for prophylaxis and vaccination measures, which should always be instituted in doubtful cases, it is not very important that a correct diagnosis be invariably arrived at, since it is, after all, the severity of the pain and not the name nor even the pathological character of the disease that is of the most importance in the selection of the prescription.

Prognosis.—The prognosis of membranous croup is always grave. If seen early, and proper treatment be applied, it need not be necessarily fatal, but unless prompt measures are instituted at an early stage of the process it is almost certain to result as disastrously as tracheal diphtheria. The child succumbs to direct suffocation or dies from carbolic acid poisoning because of interference with the proper oxygenation of the blood. Membranous croup that has diphtheria as its base may be said to be invariably fatal, but when of non-specific origin there is a fair chance in strong children—whose cases are seen in the first stage, or stage of catarrh, those covering on an average three or four days—to cut it short by treatment; though it may drag out as long as ten days from the time the first evidences of illness are noticed. The second stage of illness lasts usually but one day, or at the most thirty-six or forty-eight hours, in its acute development. Occasionally it may last for a week. The third stage, or stage of collapse, covers but a few hours, the pain being promptly turned as a rule, or life quickly terminated when collapse sets in. Very acute membranous croup runs its course and ends fatally in one or two days, or it terminates unfavorably with equal promptness. In other cases it may be two or three weeks before the child is fully recovered, or before death terminates life by gradual stenosis and exhaustion from protracted and severe efforts at breathing. Contrary to the rule in diphtheria, intubation and tracheotomy are successful in this form of laryngeal disease, so that with a clear

diagnosis, besides medication, we have these operative procedures to assist in reducing the mortality. If the case be in no wise dependent upon acute infective disease other than diphtheria, as measles, scarlet fever, typhoid fever or small pox, the prognosis is correspondingly grave. Ordinarily it is not often seen in association with or as a sequel to these diseases. In spasmodic croup recovery is the almost invariable rule, while in membranous croup just the opposite is true, hence the necessity for care in the diagnosis and for promptness in the exhibition of remedies. Cases that are believed to be spasmodic croup that do not yield with reasonable promptitude to the well selected remedy are to be viewed with suspicion, and the prognosis made accordingly.

Treatment.—Under old school treatment "internal medication has over the false membrane of croup no control. Emetics may dislodge loose fragments, or more especially relax spasm and give temporary relief, but for the most part they add their own depression to that of the disease and are not to be recommended." (Whittaker.) This testimony is given in this connection because I have seen in homeopathic practice efforts directed toward the dislodgment of the membrane by emetics. Surely if these are of no avail in the hands of such competent practitioners as Whittaker, and if they are not deserving of consideration at the hands of old school authors, they should find small favor among homeopaths. The local application of steam by inhalation from a steam atomizer, or from a steaming vessel in a closed room, or under an improvised tent, may prove somewhat beneficial in tempering the atmosphere to the temperature of the larynx, and at the same time rendering it moist. Application of medicaments in this manner as practiced by physicians of other schools is not to be commended. Local treatment is unavailing, because croup is a disease of the early years of childhood when it is not easily possible to apply local remedies.

Intubation is in great measure a successful expedient when the disease is limited to the larynx, but is of no value if it has extended to the trachea and if the bronchi are involved. Tracheotomy as at present practiced is in no sense a hazardous operation and sometimes succeeds when intubation fails, if the strictly tracheal site be selected for the introduction of the tube. The figures of recent authors go to show that tracheotomy will rescue sixty per cent. of non-diphtheritic cases, and about thirteen per cent. of the cases of laryngeal diphtheria. As Whittaker suggests, if this operation and intubation were practiced earlier results would be even more favorable; and since children have been saved by both operations even after they have ceased to breathe, no case should be given up as lost by asphyxiation upon whom one or the other, or both, operations have not been tried. Recent old school measures include the vaporization of calomel as a therapeutic

agent, which is popular in the east. It goes under the name of the Brooklyn treatment, and consists of the application of calomel by vaporization, the result of the burning of fifteen or twenty grains of the powder upon a tin plate, the child inhaling the fume of this under a curtain, or improvised bed-test. Other equally objectionable measures are the moistening of the pharynx with a solution of nitrate of silver of the strength of one to thirty, and the bathing of the throat with a solution of corrosive sublimate in the strength of one part to one thousand every two hours through the day and every three hours at night. The inhalation of turpentine and the hypodermic injection of turpentine and vaseline are practiced, and the tincture of iodine, in doses of one-fifth of a drop every fifteen minutes until improvement set in, has been employed. It can easily be seen that these measures are really empiric, and have no basis of law to support them. The calomel vaporization has caused salivation of attendants, and the corrosive sublimate has resulted equally disastrously with the patient. The uselessness of the old school methods is the more noticeable in comparison with the action of the indicated homeopathic remedy.

In the first, or catarrhal stage, it is not often that it will be necessary to go beyond *Acute*, *Ferrum Phosphoricum* and *Belladonna*. If the child be taken sick suddenly with a sharply defined chill, restlessness, headache, rise of temperature, and the full bounding, sharply dichrotic pulse of *Acute* this remedy will often abort the disease by allaying the hyperemia of the mucous membrane and thus preventing the exudation of sero-fibrin which forms the film upon the mucous membrane.

Ferrum Phosphoricum.—If the case is slow in its onset and is the result of acute cold and attended by slight feverishness, languor, irritability, headache and passing sore throat, *Ferrum Phosphoricum* will suit better than *Acute*. It is claimed by some that it is more applicable to the membrane characterized by exudation during the inflammatory stage than *Acute*, the latter being better suited to unusually acute inflammatory conditions.

Belladonna.—More applicable to inflammatory conditions of the throat. Pain is shown by sudden closure of the throat, spasmodic in character, with early cyanosis, full, throbbing arteries, intense headache and convulsions.

Dulcamara.—A remedy to be thought of in cases that result from exposure to raw damp winds, or that arise from the taking of cold by getting the feet wet. Its symptoms are more acutely catarrhal than those of *Acute*, in that there will be suffusion of the eyes, and bland, nasal coryza from the first, with aching of the limbs and muscular system generally.

The passage from the acute catarrhal stage is often not recognized, because of the insidiousness of the disease and its stealth. The time for the application of the catarrhal remedies passes, and

the stage that calls for the administration of *Bromium*, *Kali bichromicum*, *Arsenicum iodatum*, *Sanguinaria*, *Tartar emeticus* and *Kali muriaticum* may be fairly on before the case is known.

Bromium.—This remedy is especially applicable when the cough is dry and whoezy, and the suffocation is acutely marked. Great physical effort is required at each respiration. The *Bromium* cough is tympanic and resonant. The inspiration is dry and whistling, the expiration so moist and rattling that mucus is not raised from the larynx. While *Bromium* is more applicable to spasmodic croup, yet it is occasionally useful in the membranous form, especially if the presence of the exudate results in irritation and spasmodic constriction.

Kali bichromicum.—Kali is especially adapted to short, thick-necked, fat children. The voice is very hoarse and the cough constrained. *Kali bichromicum* corresponds to the pathology of the disease. Tough, stringy expectoration with exudation of morbidological lumps. Great sensitiveness of the larynx, with the characteristic board-sawing inspiration and cough.

Hepar sulphur.—Hepar is especially indicated when the child complains of the membrane as though it were a foreign substance in the throat, causing stitching pains in the throat and from ear to ear. The cough is hoarse and rattling and inspiration is very difficult. The throat symptoms together with the hoarse rattling symptoms are more characteristic of diphtheria than is dyspnoea.

Arsenicum iodatum.—The iodide of arsenic is especially applicable in cases of ill-nourished children. The cough is hoarse in the morning with rather less of exudation. Fibrinous exudation occurs from the throat, increasing the hoarseness and causing a tendency to stupor. The child may be exceedingly restless and in great anguish from impending suffocation. In stages of debility and exhaustion, the croup continuing and thus combining the symptoms of *Arsenicum* and *Iodine*, the iodide of arsenic will be found especially beneficial.

Kali muriaticum.—This remedy corresponds in a general way with the second stage of inflammation in fibrinous exudation, lymphatic enlargement and infiltrated inflammation. It has white or gray exudations, sudden discharges of expectoration of a thick, gray, fibrinous slime or phlegm from the mucous membrane. (Boericke and Dewey.) It is suited to hard, croupy cough; cough is harsh and barking. In croup this is accounted the chief remedy in the exudative stage.

Sanguinaria.—The blood-root is better suited to cases in which bronchial irritation and inflammation are associated with croup. The cough is severe and is exceedingly hoarse. Contraction of the throat with fullness of the larynx, and loss of voice.

Tartarus Emeticus.—This remedy is especially useful for the hoarseness which is worse in the morning. Secretion tough,

rattling expectoration so that it sounds as though the throat was full of it. It is applicable in the latter stages when the skin is cold and clammy, the child is relaxed and exhausted, the skin is cyanosed, and indications point to early demise.

Cratichneum, *Ammonium*, *Spongia*, *Dionaea*, *Kali phosphoricum*, *Lithia*, *Acetic acid*, *Lauracerasus* and *Argentum nitricum* also have to be studied in individual cases; but as a rule it will not be necessary for the homopathician to go beyond *Aconite*, *Belladonna*, *Ferrum phosphoricum* and *Dulcamara* in the first stage, and *Kali bichromicum*, *Ariseum*, *Asiatum* and *Hepar sulphur* in the second and third stages.

Diet and Hygiene.—During the severe paroxysms of membranous croup it will be impossible for the child to take nourishment, for all its efforts are being expended toward getting breath to live upon, nor will it need much nourishment during the expenditure of its efforts in this direction. Water should be given in plenty, though as a rule the child is hardly able to spare the time from its breathing to partake of water. Should it be necessary to nourish it over a considerable period of time, milk, *Bojalis*, *Valentine's Beef Juice*, *Murdock's Liquid Food*, and other such nourishment may be given in its drink. If the case be protracted and it be not possible to administer nourishment per os the child may have to be sustained by nourishing enemata. These may consist of milk or any of the beef preparations named, or milk and egg with perhaps a little alcohol added.

The hygiene of the croupy child should be of the best. While it may be advantageous in special cases to steam the room, it should never be forgotten that the cry is for air and in plentiful quantity. Many parents and many physicians shut out the fresh air lest the croupy child take cold, depriving it of its supply of oxygen, the very thing it most needs during its struggle for life. No matter how warm the temperature of the room should be, nor how moist the atmosphere should be, it is never permissible to close the doors and windows and stuff the cracks with rags or weather strips that fresh air be excluded.

An available adjuvant in the treatment of membranous croup, especially when asphyxia threatens and cyanosis is pronounced, is nascent oxygen. This may be administered, as in diphtheria, direct from the cylinder draught-tank, and in its absence efforts may be made at supplying it in quantities from nature's laboratory by freely admitting pure air to the sick room. I have no sympathy with practices of stuffing and steaming.

CHAPTER LXXV.

PLEURISY.

General Considerations—Etiology—Types—Pathology—Symptoms and Course—The Effusion—Diagnosis—Prognosis—Treatment.

General Considerations.—Pleurisy or pleuritis is an inflammation of the pleural sac, thought by bacteriologists to be caused by infection of the pleura, either by the diplococcus or streptotubercula. It is not considered, however, that it is invariably due to micro-organic infection. It has been commonly thought to originate from the taking of cold, or from traumatism, and the fact that persons in apparently perfect health by exposure to a draught of air or sudden suppression of perspiration may develop a violent pleurisy within a few hours, so severe as to be almost unbearable, places an interrogation point after the theory that it is always due to an infective principle.

As seen in childhood it is more often, perhaps, a secondary than a primary affection. It occurs with considerable frequency, the greater number of cases being seen in the first five years of life, the second five years affording the next largest number. It occurs with about equal frequency in the two sexes, boys being perhaps somewhat more subject to it than girls, because of their greater liability of exposure to inclement weather and sudden changes of temperature, and because of the carelessness of their habits while at play. The left side shows a slightly greater predisposition to pleurisy than the right. Simmonds collected one hundred and fifteen cases of which one hundred and three were on the left side, while Hofmøhl tabulated sixty with thirty-three on the left side. (Koplik.) As commonly seen, but one pleura is involved in the inflammatory process, though in association with pneumonia or tuberculosis both pleurae may be affected.

Etiology.—Modern authors consider pleurisy due to a specific micro-organic cause. The researches of Netter and Levy go to show that most cases of pleurisy are due to the diplococcus and pneumococcus, as seen in connection with pneumonia. Pathological investigation shows the presence of various micrococci in other cases of pleurisy, but the particular species will depend upon the cause of the disease or its association with other diseases. If seen in connection with tuberculosis the comma pulse is present. If it occurs in connection with typhoid fever, as is often the case, the pseudo-typhoid pulse is found. If, in connection with scarlet fever, diptheria, septicæmia or abscess formation anywhere other than tubercular, streptococci, staphylo-spirilla and saphrogenic

bacteria are found in the inflamed tissue and exudate. They are considered as holding causative relation to the disease.

Pleurisy seen in association with rheumatism and occurring as an idiopathic affection without discoverable cause, with simple serous effusion as a result of the inflammation, always shows micro-organic forms.

It may be caused in connection with Bright's disease from chemical products and toxins, but occurring so often as a secondary ailment it is safe to say that by far the large majority of cases of pleurisy are dependent upon previous organic lesions, and that the micro-organisms of these lesions are responsible for the pleurisy.

Pleurisy occurs in the course of puerperal fever, typhoid fever, scarlet fever, rheumatism, dysentery, bronchitis, pneumonia, tuberculosis pulmonum, septicæmia, pyæmia, gonit and other conditions of ill-health. It belongs more commonly to children who are of tuberculous predisposition, and those of rickety habit. Pneumonia and pleurisy are so often associated that where pain is a factor the pleura is almost always involved. When extensively affected, and associated with lung involvement, the disease is known as pleuro-pneumonia; but then the simplest case of pneumonia is almost certain to have pleuritic inflammation.

Types.—While it may be proper to define the different types of pleurisy in relation to the diseases causing them, or with which they are seen in association, yet the usual division is into *pleuritis siccæ*, in which there is little, if any, effusion, and *pleuritis humida*, or pleurisy with effusion. The former is sometimes called true pleurisy, the latter fibrinous. Clinically pleurisy is also divided into acute, sub-acute and chronic pleuritis, depending upon the nature of its course as an idiopathic ailment, or, if it come on suddenly and extensively, with pneumonia or other disease, it is termed acute pleurisy. If it appear gradually and passively in association with other ailment it is then termed sub-acute pleurisy; whereas, in association with tuberculosis as a constant feature of the case, and as seen in non-tubercular individuals as a confirmed affection of the pleura, following upon acute pleurisy, it is denominated chronic pleurisy.

The effusion of pleurisy may be serous, sero-fibrinous, purulent, sanguineous or ichorous, dependent upon its contents being serum, fibrin, blood, or ichorous secretion. Tubercular pleurisy is the name given to pleurisy as seen in association with tuberculosis of the lungs, but which is too often considered as an idiopathic affection occurring during the course of tuberculosis, and in connection with that disease. This classification is important in relation to treatment, tubercular pleuritis being among the more painful manifestations of acute phthisis as seen in children and youths.

Pathology.—The pleura is a connective tissue sac made by elastic fibres, connective tissue cells and endothelium. When pleurisy occurs in connection with pneumonia the lesion may consist simply in a slight hyperemia of its pulmonary surfaces, but as its exudation is thrown out, fibrinous threads or adhesions may be seen over the surface of the membrane. In severer cases, where the effusion is more extensive, the membrane may become thickened on both its pulmonary and external surfaces. In children the membrane may be very much thickened by the inflammatory process with slight effusion.

In some forms the pleurisy exudation that is seen on the surface may be accompanied by a considerable quantity of serous exudation into the pleural sac. This may be clear, turbid or opaque, eventually becoming yellowish or greenish in color. Though the acute inflammatory process be very violent considerable masses of fibrin may be seen in the pleural sac, thus adhering the lung and pleura together, even pinning the lung down and interfering with its mobility. In severe cases this fibrinous coat may permanently impair the function of the lung, this being especially the case in pulmonary tuberculosis with pleurisy as an accompaniment; moreover, the more prolonged and confirmed the pleurisy the greater the likelihood of adhesions. These adhesions in some cases are firm, fibrinous points of considerable thickness and density, with minute blood vessels coursing through them, the pleural surfaces of the lung and pulmonary surfaces of the pleura being quite firmly held together, with a moderate degree of mobility of the two tissues.

Tubercular pleurisy generally results in considerable thickening of both surfaces of the pleural membrane, caused by the inflammatory exudation from the pleural tissues, these becoming infiltrated with tubercle. In these cases there may be, besides considerable production of fibrin, quantities of serum and pus, either clear or admixed with blood. In many cases of tuberculous pleuritis, and also in acute pleuritis, the membrane remains thickened and sensitive over a long period of time, with permanent adhesions and more or less serious lung impairment.

The effusions that take place within the pleural sac may appear from time to time. The amount of leucocytes, red blood cells, and endothelial cells is never extensive, aspiration of the pleura removing at one time an opaque or purulent fluid, at another time a hemorrhagic fluid. Certain drug agents are known to find their way from the general circulation into the pleuritic blood, as iodine, salicylic acid, quinine and perhaps other drug agents. This thought suggests an effort on the part of nature to apply these agents directly to the cure of the ailment, an effort which eventuates in excess of gain, the excess finding its way into the pleural fluid, there to remain unabsorbed.

Symptoms and Course.—The symptoms and course of pleurisy will depend very largely upon the nature of the case. Acute pleurisy is attended by symptoms that are so pathogenic as rarely to be mistaken for those of other conditions. It is usually ushered in by a chill, though this may not be noticed in very young subjects. The chill is sharp, acutely defined and lasts over a period of from a few minutes to half an hour or an hour. This is quickly followed by a fall of the temperature, amounting to one hundred and three or one hundred and five degrees within two or three hours. The pulse is also very rapid, even double its natural rate. The characteristic feature is sharp, lancinating pains in the side, below the armpit, two or three inches to the left of the heart in left-sided pleurisy, and at a corresponding point on the opposite side when the right side is involved. This pain is so sharp as to take the patient's breath. It is intensely aggravated upon efforts at deep inspiration, turning the trunk, lifting the arm, assuming an upright posture, or, in fact, from any change in position. There is generally sharp, dry cough, which is very distressing because of the pain associated therewith. If the child is old enough it will attempt to hold the side steadily in order to avoid motion and the pain that accompanies. It will also resist the cough as much as possible, and cry upon coughing because of the pain resulting. Dyspnea is also a pronounced symptom, doubtless because of the involuntary effort of the lung to avoid expansion, and because of the contraction of the pleura that results from its irritation. The physical appearance, while not pathognomonic, shows flushing of the face which may be extreme in case of elevation of the temperature; otherwise the face is pallid and distressed, the features are drawn and exhibit suffering; the tongue is dry; the patient is thirsty, has headache and would be extremely restless were it not for the pleuritic pain. In very young subjects the case may be ushered in by convulsions instead of a chill, or there may be a series of shivering fits, quickly followed by fever and pain. From pneumonia this type of pleurisy will be differentiated by the fact that there is not the increased frequency of breathing that belongs to inflammation of the lung. If the patient's pain will permit of it, he is apt to take a long breath, showing profound expansibility of the lung, whereas in pneumonia the breath is rapid and bounding because of lack of ability to properly expand the air cells. The pleurisy patient is almost certain to lie on his well side, though in individual cases he may prefer the prone position, with the sick side supported on something hot or resting on a pillow. There is no expectoration with the cough in acute pleurisy, nor are there special signs relieved by percussion. Auscultation shows a fine subcrepitant rale, recognized to be superficial rather than deep, and limited to the area affected. It is called the friction sound of pleurisy, and may last but a few hours, or a day or so at

most, in acute simple pleuritis. As soon as effusion occurs it disappears, and if the fluid is eventually absorbed it will be heard again until the case finally clears up. It also disappears with the formation of adhesions and when resolution takes place.

The second stage of acute pleurisy is called the stage of effusion, and with the development of this stage the breathing becomes increased in frequency, the pulse somewhat irregular, and local cyanosis may show. If considerable effusion forms quickly the affected side of the chest may bulge, the intercostal spaces become more prominent and the ribs more widely separated than normal. The apex of the heart is somewhat displaced toward the right in left-sided effusion, and toward the left in right-sided effusion. As effusion occurs the percussion murmur is lost and adhesion is observable upon percussion. If a considerable quantity of fluid is secreted it can be heard to swash with changes in position of the patient. Percussion of the breath, immobility of the lung, altered resiliency and irritative cough are apt to follow upon the accumulation of a considerable quantity of fluid in the pleural sac. The sounds are muffled, bronchial respiration is more doubtful, bronchophony is distinct and a peculiar, tremulous note, known as egophony, which is produced by the laxity of the lung tissue, is heard just above the level of the fluid.

THE EFFUSION.—The fluid secreted in acute pleurisy is serous or sero-fibrinous. If it should become purulent in character the symptoms and course of the disease are changed. The temperature, which bounded in the initial stage to 103° , 104° , or 105° , and which fell with the subsidence of the acute manifestations, rises again to 103° or 104° , especially in the evening. Shiverings, or chilly sensations intermingled with heat, are pronounced; the patient loses appetite and strength, becomes nervous and restless and is unable to sleep; headache, flushed face, light sweats, and perhaps alternations of chilliness, feverishness and sweats occur, these symptoms being attendant upon the change in the character of the fluid from serous or sero-fibrinous to pus. It is not always that this change is attended by pronounced alteration in the character of the symptoms, but as a rule the symptomatology is considerably altered in the direction of that of pus formation. In individual cases the change is so gradual and so unattended by pronounced symptoms that a diagnosis of pus in the sac will depend upon aspiration alone. This may be accomplished by a clean hypodermic syringe and a sufficient quantity of serum be drawn off, without special pain or inconvenience to the patient, to determine the nature of the fluid.

In subacute pleurisy the onset is more insidious. The child, ill with some other type of disease, or not altogether well, may develop a marked febrile movement lasting over a few hours, with a moderate degree of pain in its side. There may be cough, but so slight as not to attract attention. The fever continues as in

remittent form, the child is languid and debilitated; complains of headache, silent cough; favors the sick side; altogether is not well. In such cases the temperature range is never very high, 101° or 102° in the evening, the fever partaking somewhat of the hectic. If occurring in any of the acute exanthemata, or following upon pneumonia, or if observed in a tuberculous child, the symptom will be that of aggravation of the general condition, including absence of moderate pleuritic pain and slightly accelerated pulse, with a moderate degree of fever. If it be a lung process with which it is associated, cough is apt to be excited and the breathing more or less interfered with, while if occurring in association with other disease, the pain in the side, owing to increase of fever, and the disposition on the part of the child to favor the lame side, will be all there are to attract attention to the pleura, unless considerable effusion follows.

Diagnosis.—The diagnosis of pleurisy will turn upon the pain of the side, the acuteness of onset, the quick rise of temperature, the limited respiration, the presence of the percussion sound, and the tendency to cough with disposition to resist it because of the pain that comes. The position of the patient is sought to be made helpful, preference being given to the sick side, and to the involuntary support of the sick side, in order to secure a greater degree of mobility.

From pneumonia it will be differentiated by the more acute character of the pain, the absence of expectoration, the percussion sound, the expansibility of the lung and the absence of the rapid breathing that belongs to lung inflammation. The fever of pneumonia is higher as a rule, the cough is more persistent and constant, the rusty colored expectoration is pathognomonic. There is crepitus also in pneumonia, with dullness, percussion, bronchial respiration, more of tendency to delirium, and in every way the patient is more evidently ill.

Prognosis.—The prognosis of simple pleurisy is invariably favorable. It cannot kill. Extensive pleurisy in association with pneumonia complicates the pneumonic case, but, after all, if a fatal issue occur, it is the lung inflammation that is responsible therefor. If occurring in association with tuberculosis pleurisy becomes a graver affection. The systemic onset that lights up pleurisy is very apt to light up also acute manifestations of tuberculosis in the lung, and thus, while pleurisy may be the initial symptom in the case, yet again it is the lung condition that is serious. Pleuritic effusions that become purulent in character are dangerous in special cases, in that the general health may become seriously impaired. Septicity is not a common attendant upon tubercular effusion in the pleural sac, yet it may result therefrom. In individual instances the drain upon the child's vitality that is caused by the continued formation of effusion, together with the septic

symptoms that arise from its purulent character, exhaust it, resulting in serious decline in health. If the lung become involved in purulent abscess formation, as a result of pus in the pleural sac, the case becomes dangerous, even involving fatality. Pleurisy occurring in the course of typhoid fever, scarlet fever or diphtheria, and purulent pleurisy occurring in connection with amebic dysentery add much to the gravity of the condition. Pleurisy may be dangerous also by reason of the enormous quantity of fluid secreted and the sunken condition of the lung. The heart displacement is not apt to be serious, depending more often upon the changed resiliency than upon the quantity of fluid in the pleural sac. It has been observed that the pericardium, being smaller in structure than the pleura, may become affected from an infective pleura with pericardial effusion as a result.

Treatment.—Acute pleurisy can often be materially modified in severity by local application to the chest, while if the case be typically one of idiopathic pleuritis, hot fomentations, best in the form of cloths wrung out of hot water with dry cloths over them, or mustard plasters, linseed plasters, steamed or dry hogs, or cloths wrung from very hot water plus the tincture of the remedy given internally, or the application of dry heat, as a bag of hot salt, bran, or dry flannel cloths, are often comforting to the patient and seem to assist in alleviating his sufferings. If the pain be so acute that profound immobility of the affected side seems to be desirable this may be accomplished by the application of adhesive straps extending from the affected side to the back, up over the chest and in different directions, applied along the nerve course, crossed and criss-crossed until the side is held so securely that but slight degree of mobility is possible. Lung measures of this kind are extensively practiced in domestic medicines. The application of perons plasters, caprine plaster, poor man's plaster and various other splints are nearly always resorted to before the physician sees the patient.

The remedies most likely to be useful in the treatment of acute pleurisy are but few in number. *Acute, Bryonia, Belladonna* and *Axlepias tuberosa* covering the field in nearly all cases. Other remedies, as *Ferrum phosphoricum*, *Cantharis*, *Apis mellifica*, *Kali carbonicum* and *Phosphorus* may be needed in special cases. In constitutional pleurisy, or pleurisy depending upon profound constitutional states, the basic remedies that cover the totality of the case will be the ones upon which most dependence will have to be placed. When exudation has occurred *Arsenicum*, *Hepar sulphur*, *Mercurius*, *Kali auratiatum*, *Nofram mariaticum*, *Bryonia*, *Indium*, *Silicea* and perhaps other remedies will have to be carefully selected. For tubercular pleurisy *Kanack*, *Sambucus*, *Tuberculinum*, *Sulphur*, *Arsenicum iodatum*, *Phosphorus*, *Calcarea sulphurea* and *carbonica*, and *Prostrum* may be required.

Acute is applicable to cases of simple acute pleurisy presenting the customary *Acute* symptoms, the case being caused by exposure to cold, raw, damp winds, or from sudden suppression of perspiration. Sharply defined chill, quickly followed by fever, thirst and restlessness, anxiety and sharp cutting pains in the side.

Bryonia is perhaps the best single remedy for the severe pain of acute pleurisy. Its affinity for serous membrane is well known, and in no condition is its characteristic irritation upon motion more pronounced than in pleuritis. The pain is lincinating, stitching, stabbing in character, worse upon the slightest effort to move, aggravated even by the jarring of the floor or slamming of a door. Patient is compelled to lie painfully quiet in one position, preference being given to the sick side, because of the fear to move on account of the suffering it causes. *Bryonia* follows *Acute* well, and is one of the best of remedies to prompt absorption of serous effusion.

Belladonna is called for more often in the pleurisy of children than of adults. The case partakes of the congestive type; the patient goes into acute paroxysms, lies more on the right side, and early shows extreme cyanosis. Is especially applicable to cases ushered in by convulsions instead of chill.

Asclepias tuberosa, or pleurisy root, is an excellent remedy in pleurisy with dry, hacking cough; scanty, mucous expectoration; pain relieved by bending forward. Sharp, stitching pains in the right side, shooting over left side and left shoulder. *Asclepias* is especially applicable to pleurisy in association with pneumonia where the suffering is intense, and is also a remedy of value in acute manifestations of pleurisy in association with tuberculosis.

These four remedies will be found to cover cases of simple acute pleurisy, but others may be demanded.

Cantbaris is frequently recommended as especially useful in pleurisy with serous exudation, palpitation of the heart, tendency to syncope, dyspnea, with cough and profuse sweats. The fever of the *Cantbaris* patient is superficial, that is, the skin is intensely hot and dry, out of proportion to the temperature. *Cantbaris* and *Apis* are especially to be thought of in association with effusion.

Arnica is more applicable to general pleurisy with extreme muscular soreness, so sensitive to pain that the patient is afraid to be touched; tongue brown and dry; tendency to sopor and the presentation of typhoid symptoms.

Artemisia will often be called for in the treatment of pleurisy when there is prostration, impending collapse, serous effusion, asthmatic breathing and rapid increase in dyspnea on account of excessive accumulation of fluids in the chest. This remedy is more applicable to subacute pleurisy and with its congener, *Artemisia jodatus*, is useful also in the chronic pleurisy of consumption, the effusion being purulent in character, the general

state of the patient being closely allied to that of sepsis, confirmed hectic symptoms, cough, emaciation, night sweats, and edema of the extremities. Occurring in connection with tubercular pleurisy or with the chronic purulent variety, pleurisy will call for *Aesculus*, either the *album* or *johanna*. *Hepar* is useful in long standing pleurisy with plastic secretion, fever, emaciation, chilliness and general hectic condition. Effusion has found its way through the lung and is discharged as putrid, offensive, decaying pus, with general unwholesomeness of the patient and progressive septic symptoms. *Hepar* will often help to clear up the confirmed cases of purulent pleurisy where galloping consumption is apparently threatening.

Calcaria sulphurea is rightly accounted closely allied to *Hepar* and is to be thought of in cases of empyema and chronic purulent inflammation of the pleural sac. It is especially applicable in incipient phthisis in children and young girls with pleuritic inflammation.

Kali carbonicum is valuable in pleuritic attacks that do not yield to *Bryonia*, especially in tuberculous pains without the violence of the *Bryonia* attack. *Kali carbonicum* and *Calcaria carbonica* will be studied in connection with the phthisical states in children with occasional outbreaks of mild pleurisy. *Sulphur*, *Psorinum* and *Silica* are also useful in this connection. *Silica* is to be recommended in profound changes of the pleuritic effusion to the purulent variety, and for mitigating oncoming violent pleurisy. It retards pus formation and will often be found useful in those cases where the tendency is to continue in this condition in spite of apparently well-directed remedies.

Rumex, *Rhododendron* and *Ranunculus* will be required during the course of tuberculous pleurisy, for the pleuritic pains. *Sulphur* and *Psorinum* may be needed to clear up a latent pleurisy with purulent expectoration or discharge of purulent fluid upon aspiration, especially in phthisical subjects and constitutionally unhealthy children.

Confirmed cases of chronic pleurisy with threatened lung inflammation will need cod liver oil, petroleum emulsion, nourishing and supportive diet, climatic change, and all the care and treatment that are demanded in the management of incipient phthisis in children.

CHAPTER LXXVI.

BRONCHITIS.

General Considerations—Etiology—Symptoms and Course—Capillary Bronchitis—Physical Signs—Prognosis—Treatment.

General Considerations.—Bronchitis is an inflammation of the mucous membranes of the bronchial tubes. It is one of the most frequent of the diseases met with in child-life, being especially seen in children and in old people, though it belongs also to middle years. It is recognized in acute forms, and also in chronic forms, as a circumscribed bronchitis and a diffuse. The inflammation may commence in the upper air passages and continue downward, or the inflammatory process may have its first onset in the upper bronchial tubes and even in the bronchioles, extending downward and forming the type called ascending bronchitis. When it is limited to the bronchioles it passes under the name of capillary bronchitis, a form that is especially common and most dangerous in young children. This type is also seen in advanced life.

Bronchitis often appears as a symptom of systemic disease rather than an idiopathic affection. It may be in some cases a very simple ailment and easily controlled, and in others may be quite the reverse. If associated with scarlet fever, small pox, or typhoid fever it possesses far greater significance than if occurring in association with simple cold as typical catarrhal bronchitis.

Etiology.—Perhaps the most common cause of bronchitis is cold. It is especially common during epidemics of infectious diseases whether of the infectious or non-infectious varieties. It belongs also almost invariably to measles, and is common to small pox, whooping cough and diphtheria. It is rarely absent in tuberculosis and is seen in infantile asthma, as also in the asthma of adults. Typhoid fever is nearly always accompanied by irritation or catarrh of the bronchial tubes, and it is this fact that causes the careless observer to name his cases of typhoid fever pneumonic in type because of the cough and crepitus and obstruction of the mucous membrane of the respiratory passage. Bronchitis is seen also in association with erysipelas and general septic conditions, and is nearly always present in infantile marasmus and all wasting diseases. It is caused in adults, and may be caused in child-life, by the inhalation of foul gases or chemical fumes, though these factors operate more commonly with adults than with children. The chest deformities of rickets and the enervation of the teething process predispose children to bronchitis, while the sweat relaxation of teething children is one of the most common causes of acute bronchitis during that process.

Naturally, bronchitis is more often seen in the subjects of hot-house care on the one hand, and the impoverished children of squalid homes on the other. One of the most frequently operating causes of idiopathic bronchitis is the foul air of improper sleeping apartments.

Bronchial catarrh as an acute idiopathic disease is often resultant upon taking cold. Children become overheated in play or during crying spells and break out into profuse perspiration, being subsequently exposed to draughts of cold air which results in almost any of the catarrhal symptoms, sneezing, coughing, suffusion of the eyes, etc.; and before the parent is aware of it the child has bronchitis. Bathing in cool water while the body, especially the head, is hot is also a common cause of bronchitis. Sudden exposure to draughts of cold air, and raw damp winds are also excitant factors, frequently responsible for bronchitis.

Symptoms and Course.—Attacks of bronchitis vary in severity, depending upon the age of the child, the nature of the exciting cause, the season of the year, climatic influences and the local surroundings of the individual. In the milder forms it comes on insidiously as simple, ordinary manifestations of cold in the head in association with feelings of malaise, occasional chilly sensations, and perhaps slight elevation of temperature. In more pronounced cases the fever is sharper, the headache more intense, the cough sets in early with soreness of the chest and more or less soreness of the muscular system, the case generally assuming somewhat of the character of musculo-catarrhal fever. The cough is worse as the fever rises, the child is peevish and fretful because of the distress attending upon coughing, the eyes are suffused and the nose discharges a thin, sometimes acrid, coryza. These symptoms subside as the fever increases, the cough showing more dryness and irritation and the child becoming more or less stupid from the heated state of the blood and lack of proper oxygenation. In still more severe cases there are pronounced hoarseness and constant, dry, irritating cough, the latter causing considerable distress. The fever is pronounced and there may be considerable delirium. The laryngeal implication is not of long duration and the cough, which is at first dry and rasping and comes on in sharp paroxysms, becomes looser under treatment as the case progresses, and within twenty-four or thirty-six hours there is rattling of the mucous membrane in the bronchi and throat, though in young children it is not expectorated. The cough is unlike that of whooping cough in the fact that it isn't so paroxysmal, nor is there likely to be so much gagging, nor the discharge of the long strings of glairy mucus that go with pertussis. Unable to expectorate, young children are apt to raise the mucus to the mouth and then swallow it, causing disturbance of the stomach and sometimes starting up diarrhea.

Among the physical symptoms is hurried respiration, which in acute cases becomes very rapid. This rapidity of respiration, which in very young children may be three or four times as fast as normal, is due to irritation of the bronchial tubes by muscular obstruction, or to irritation of the vagus. The suppurating laryngeal nerve is the nerve especially implicated in the act of coughing, and the posterior fibres that are located well in the pneumogastric nerve, with terminal fibres in the mucous membrane of the trachea, also excite coughing when considerably irritated. Other nervous reflexes are also experienced in the throat and bronchial tubes, the rapid respiration of bronchitis being due more to this fact—the heated condition of the blood and its carbonic acid poisoning—than to the muscular irritation that is going on in the mucous membranes. Dyspnea is another physical symptom that is due in part to the rapidity of the respiration, but also to the muscular obstruction of the tubes from the swollen condition of their membranes and the mechanical irritation of the secretion that is going on. This symptom is present in some cases altogether out of proportion to the amount of tissue involved and is doubtless intensified by the toxic state of the blood, in part at least. In severe types it is so pronounced that, together with the rapidity of the respiration, it presents a distressing picture.

The pulse is rapid in young subjects, running from one hundred to one hundred and thirty, while the temperature may be elevated to 101°, 102° and 103°, or higher, but neither the temperature nor the pulse is in keeping with the difficulty and rapidity of breathing.

The physical expression of bronchitis is that of anxiety. The lips usually show more or less of cyanosis; the alae nasi are distended, and the general picture is one of distress, owing to the difficulty of breathing. This is more noticeable when the lungs are involved, but is sufficiently characteristic in bronchitis to attract attention.

Nervous restlessness is generally pronounced in the bronchitis of childhood, unless the temperature be so elevated as to cause a stupor state, when the patient will lie quiet, dull and listless, with high temperature, rapid respiration and pronounced difficulty in breathing. With every respiration there will be a groaning and moaning noise, and even though stupor the child may frequently change its position in its efforts to breathe more easily. The cough of bronchitis is generally pronounced, sharp, somewhat painful and is attended by rattling and an accumulation of mucus in the bronchial tubes. In special cases it becomes croupy in character. In other cases it is as though excited by a tickling, scratching sensation, and has teasing and persistent irritation that keeps up continually, and distresses the patient more because of its persistence than by reason of the severity of pain.

Inspection shows no special interference with the mobility of the chest. As a rule its movements are not inhibited, the air circulating freely through the bronchioles, though labored breathing may be necessary to force it through the bronchi. There is no consolidation from this, percussion revealing nothing especially singular throughout the chest; even when globular consolidation takes place it is not so likely to be revealed by percussion unless superficial.

Auscultation shows coarse, resounding, sonorous bronchi pervading the chest. These are below the cavity over the high anterior surfaces of the chest in the lateral region, behind them, and below the collar bones. In the first stage the rales are dry, indicating hyperemia and occlusion of the mucous membranes by swelling or engorgement. In young children who resist auscultation over the anterior surfaces of the chest it is usually sufficient to listen posteriorly while the child is being held in the nurse's arms. Every variety of sound is to be heard, from the dry, sharp rale of irritation to the moist rales; from the coarse sound of air passing through mucus to the finest crepitation. In some cases it is whistling, almost shrill in character. In others it is as though the chest were filled with mucus. These rales are usually symmetrical, being heard equally over both lungs, and it is their very universality, variability in character, and frequent change from dry to moist and moist to dry, depending upon the state of the fever, the condition of the atmosphere, the tension of the patient as to sensitiveness or reaction, and other variabilities, that go to diagnose bronchitis from broncho-pneumonia.

The ordinary type of bronchitis in children runs its course in from three days to a week. The initial fever soon subsides and the cough, which is at first hoarse and dry, becomes moist and gradually diminishes, remaining, however, a number of days after the febrile symptoms have altogether subsided. As the cough subsides the obstruction to breathing decreases, the mucus is discharged more freely, to be expectorated or swallowed according to the age of the subject. This is rarely tinged with blood, and not often thick and heavy. In older children, especially those predisposed to tuberculosis, it may be typically catarrhal in character. In these children, and in unusually severe cases in healthy children, bronchitis may run a course of two, three or four weeks, the fever lasting a number of days, with rapid, feeble pulse, dry, brownish, cracked tongue, and low muttering delirium, very much like the subacute typhoid state. In other cases the fever is more sharply pronounced, and owing to the difficulty of breathing the child may go into spasms, though fortunately this complication is exceedingly rare. The fever of bronchitis is remittent in character, being alternately hot and dry. It is not often that the secretion of mucus is sufficiently copious to endanger life from

suffocation, but in severely debilitated subjects it may prove to be quite serious.

Capillary Bronchitis.—Capillary bronchitis is especially seen in children. It is also a disease of advanced years, but is not met with in middle life. It is especially characterized by frequency of breathing—the respiration increasing from sixty to eighty per minute—by increase of fever, the temperature showing an elevation of 105° to 106° , and by unusually rapid pulse rate, this climbing from one hundred and sixty to one hundred and eighty, and corresponding usually with the elevation of the temperature.

In individual cases it is so closely associated with the ordinary catarrhal bronchitis as to be dependent upon it for its cause, while in others it comes on quickly, the whole respiratory tract seeming to be affected from the beginning. The special physical condition belonging to capillary bronchitis is collapse of the air cells, or atelectasis, and in consequence of this collapse the dyspnea and cyanosis are pronounced. The cyanosis is not compensated for by the rapid breathing characteristic of the condition, the movements of the chest-walls and lungs not being in harmony, the former heaving and distending to fullest capacity in auxiliary efforts at breathing, the lungs showing but little distensibility because of the collapse of the air cells.

The early symptoms of capillary bronchitis are not different from those of the catarrhal form in the early stages, except that children complain more or less of pain about the chest and in the epigastric region, this being due doubtless to the labored efforts at breathing and the tax that is thrown upon the auxiliary muscles. The difficulty of breathing is very much more pronounced than in ordinary bronchitis, cyanosis showing early and becoming extensive. It is not limited to the lungs, but spreads over the face, and even the finger-nails assume a bluish tint. In the course of a few hours in severe cases, or within a day or two at most, the extremities and finally the entire body show more or less of cyanosis and capillary stasis.

In milder cases the difficulty of breathing may not be much more pronounced than in severe cases of catarrhal bronchitis, but in severe cases of the capillary form of the disease the difficulty of inspiration amounts almost to asphyxiation. The child becomes exceedingly restless, the nostrils dilate, the thorax heaves to its fullest capacity, the wings of the nostrils dilate, inspiratory respiration occurs upon each breathing, and the epigastrium and hypochondrium are alternately distended and retracted, the picture being one of anxiety and distress, only excelled by the oncoming suffocation of membranous croup or laryngeal diphtheria. The anxiety of the patient is intense, and the struggles for air are pitiable, until from carbonic acid poisoning the nervous system becomes obtunded, the struggle less pronounced, and the child sinks into

fatal coma or a condition of stupor that renders its struggles far less distressful. The comatose state may be so emphasized as to result fatally, or convulsions may ensue.

Capillary bronchitis runs a more latent course than the acute catarrhal variety, except in anomalous cases where it develops suddenly from unusual exposure to cold or sudden suppression of perspiration. Here it comes on quickly and within twenty-four hours a strong, hearty child may be on the verge of death from general pulmonary atelectasis. As a rule, however, it follows upon an antecedent cold, the cough becoming more persistent as the case progresses, the dyspnea being the first indication of collapse of air cells. The patient may show no special difficulty of breathing, no anxiety, and nothing at first to indicate involvement of the air cells. This condition may last over a number of days with gradually increasing weakness, and not until careful physical examination of the chest is made is the diagnosis of capillary bronchitis clear. Upon auscultation the vesicular rale is absent, or is feeble and muffled. Sibilant and sonorous bronchi with scanty, tenacious expectoration, if the child is able to raise the phlegm, complete the diagnosis. If the case comes on suddenly the cough is violent and distressing from the first. It may occur in paroxysms almost like those of whooping cough, or it may be continuous. It is dry at first but soon becomes moist, though not likely to be attended by expectoration. If thrown off the quantity is small and consists at first of colored mucus, later becoming muco-purulent and more copious. The temperature is much more pronounced than in ordinary bronchitis, the pulse much more rapid, the cyanosis greater, the dyspnea more severe and gastric symptoms much more common. The extreme difficulty of breathing causes the face to be bathed in perspiration, which breaks out as profuse sweat on the forehead and face, sometimes extending over the whole body. Patient is exhausted, limp and lifeless after especially difficult efforts at breathing, its muscular system completely relaxed, its head rolling in any direction, its neck sunken and drawn, its features distorted and cyanosed, and its extremities cold and blue, gradual asphyxiation closing the scene in most cases.

Capillary bronchitis lasts usually three or four days in the severe manifestations, death commonly resulting at the end of about a week of illness in children. In cases that weaken the system the course of the disease may drag along interruptedly for three or four weeks, and in subjects who are disposed to phthisis may result in the lighting up of the florid type of this disease, a result occurring especially in children from ten to fourteen years in whom the capillary form of bronchitis develops more because of the lung weakness, the pulmonary complication—rather than bronchitis—being the responsible disease in the case. In occasional severe manifestations convulsions may terminate the case as early

as the second or third day, but it should be borne in mind that as a rule capillary bronchitis is developed slowly in children already suffering from catarrhal bronchitis or severe colds, the acutely violent, fulminating type being rare, and due usually to severe exposure.

Capillary bronchitis is seen as a sequel to measles, whooping cough, typhoid fever, small pox, and other acute diseases. It is also doubtless often responsible for deaths in the course of pertussis and is also doubtless mistaken in many cases for catarrhal pneumonia in child-life.

PHYSICAL SIGNS.—Inspection does not show any positive alteration in the size of the chest, unless it is in the direction of the bulging due to the severe and labored efforts at respiration. The respiratory movements are exceedingly rapid, and it occasionally happens that palpation will reveal crepitus, in most cases felt over a considerable area. This is more noticeable when the superficial tubes are involved, and it is heard both with inspiration and expiration.

Percussion gives no special sign. As a rule there is a little variation from the normal resonance. Slight dullness may be expressed over the base of the lungs when the site occupies the dorsal decubitus, owing to the accumulation of the secretion or edema. The same thing is observed if catarrhal pneumonia is associated with bronchitis. If empyema is present the resonance is increased, whereas if pleural affections or general mucoid secretions have accumulated in the air cells to considerable extent the dullness will be pronounced, though not flat as in hepatization. Auscultation reveals weakened respiratory murmur over affected areas and in severe cases the auscultatory murmur may be almost entirely separated, owing to the closure of the tubes or diminution of other calibre by an accumulation of thin mucus. If the bronchi are open the signs are likely to be exaggerated. Throat will be affected, lungs will be hard, and there will be characteristic signs of bronchitis. There may be dry or moist rales. If of the former variety, as is likely to be the case in the early stage of the disease, they are sibilant or high pitched, whistling or musical or sonorous, low in pitch and coarse in tone. The sibilant rales result upon the passage of air through the contracted tubes, while the sonorous rales belong to the larger tubes diminished in calibre.

When the rales become moist they may be heard through respiration and expiration also, mucous, sub-mucous and crepitant in character, depending upon the degree of secretion that is taking place. If the disease be moderate they will not be widely distributed, and sibilant or sonorous rales will soon be followed by coarse rales. If the attack be more widespread they will be heard over considerable areas of lung tissue, both anteriorly and posteriorly. In severe cases the percussion notes are dulled at the

posterior and lower portions of the thorax, and perhaps somewhat exaggerated over the upper areas. Auscultation reveals moist rales throughout the entire lungs and a combination of whistling, wheezing, bubbling and crackling sounds is heard in a given severe case. In capillary bronchitis the rales are much more diffuse than in pneumonia.

The condition of the bronchi and the bronchioles is that of hyperemia at first, the color of the membrane varying from bright red to dark venous. In the capillary form intense congestion of the smaller tissues occurs, the trouble being increased by the extension of the secretion over the upper tubes into them. The great danger in the capillary form of bronchitis is that the bronchioles are likely to become obstructed, and, together with the other vesicles, the larger tubes are collapsed and agglutinated, preventing the free inflow of air, with resultant lack of oxygenation of the blood and carboic acid poisoning. Atelectasis is a most commonly observed condition, and bronchi-ectasis may also exist. The lungs, at first hyperemic, become edematous and eventually paler than normal, and the bronchial glands become fine, congested, enlarged and sunken. If the case drag along over considerable length of time, dilatation of the right side of the heart may occur, while a not infrequent complication is the development of pneumonia.

PROGNOSIS.—Capillary bronchitis is among the fatal diseases of childhood and requires close care and treatment to prevent fatality. The mucoid secretion that occurs in the finer bronchioles tends to cause collapse of the air cells from impeded and obstructed respiration, and gradual fatal asphyxiation. The prognosis is always grave, especially so in delicate subjects when following measles and whooping cough.

The disease is dangerous in proportion to its extent. A feeble pulse, beating with extreme rapidity, associated with coarse, bulging rales over large areas, with persistent and increasing cyanosis, argues badly. If with these symptoms a special degree of perspiration with coolness and clamminess of extremities is seen the prognosis is unquestionably very grave. The danger of development of pneumonia, or occurrence of edema, pleurisy, and heart complications, adds to the gravity of the situation, and when all these conditions are present the prognosis is rendered more certainly unfavorable. At best capillary bronchitis is among the severe diseases of children and demands careful and persistent treatment for its cure.

TREATMENT.—Capillary bronchitis is not often seen in the initial stage, hence the time for the administration of *Aconite*, *Ferrum phosphoricum*, *Veratrum viride* and remedies of their type is usually past before the physician is called in. If, however, the case be seen early *Aconite* may be able to abort or materially

relieve the course of the disease. It is applicable when the illness arises from taking cold upon sudden checking of perspiration, followed by chilly sensations, high fever, hot, dry skin, thirst and restlessness. The cough is dry and titillating, increased by respiration, worse morning and evening, during sleep, and attended by painful sensitiveness of the chest. The characteristic restlessness of the disease with high fever is the symptom that will indicate *Acowite* as the remedy.

Ferrus phosphoricus is more likely to be needed in the capillary bronchitis of young children than *Acowite*. The cough is sharp, short, spasmodic and painful. It occurs in paroxysms, the face is congested, but the fever is not as intense as with the *Acowite*, nor is there the degree of restlessness that goes with it.

Belladonna will be useful if the case assume a congestive type from the start, with surface cyanosis, paleness of the lips and finger-nails with tendency to sopor or convulsions.

Dryopteris will be found to be the remedy in cases in which the cough is severely harsh and racking, especially painful, with pleuritic stitches, the child desiring to lie perfectly quiet in order to avoid the pain and aggravation of the cough that arises from being moved. The cough is hard, racking and dry.

Ipecacuanha is useful in the later stage when the chest is filled with mucus and sibilant rales. Cough comes on in paroxysms, almost suffocating the child, its face becoming livid, with dyspnea, nausea and vomiting of a copious secretion of stringy mucus at the end of the paroxysm. It is especially indicated in the capillary bronchitis of children when the cough is lessening and the tubes are filled with mucus.

Hepar sulphur.—*Hepar* is indicated when there is much wheezing in the chest, indicating an association of asthmatic symptoms with those of bronchitis. The child is hoarse, the cough coarse and rasping, though not harsh and dry; the child sits up to breathe because of its asthma.

Drosera will be found an excellent remedy when the cough is violently spasmodic, even convulsive as in whooping cough, titillation of the throat, and stitches in the larynx. Inspiration is so labored that a simulation of whooping cough soon occurs. Child coughs in paroxysms until it gags and vomits.

Kali bichromicum.—This remedy will be found beneficial in cases in which the expectoration is thick, stringy and ejected after severe paroxysms of hard, dry cough. The difficulty of breathing is pronounced, and seems to depend upon the thickening of the lining of the membrane of the tubes. *Kali bichromicum* is recommended by Lillenthal as especially applicable when the child suffers so severely from dyspnea as to throw its arms about wildly. Spasmodic heaving of the chest almost amounts to apnothosis.

Nervousness predominates, the anguish of the child being increased gradually.

Pulsatilla.—I have found *Pulsatilla* an excellent remedy in capillary bronchitis of moderate severity in *Pulsatilla* subjects. The cough is easy and the expectoration thick and yellow. At night the cough becomes dryer and more spasmodic so that the patient has to sit up in bed to cough. Gastric symptoms predominate, coughing being associated with emesis.

Tartarus emeticus.—No remedy is better in bronchitis than *Sibbum* when the chest is full of mucus with rales heard in every direction. The child coughs as though the whole chest were filled with mucus, and is unable to expectorate. The breathing is rattling and the cough more rattling. Will be found especially applicable to cases that are disposed to be protracted.

Calcarea carbonica should be thought of in "scrofulous" children, and in teething children in whom the cough is less, with rattling of the mucus not so pronounced as with *Tartarus emeticus*, and with oppression and thinness of the chest. Breathing difficult, cough dry at night, less in the daytime, child laboring for breath, with profuse sweat on the head, neck and chest upon falling asleep. Will often be found the basic remedy, though not usually directly beneficial for the severe paroxysms of cough and suffocation.

Besides the remedies mentioned, *Phosphorus*, *Lycopodium*, *Spongia*, *Rumex*, *Sulphur*, *Kali muriaticum*, *Iodum*, *Cactus* and *Arsenicum* may be required. Of these *Lycopodium*, *Arsenicum* and *Cactus* deserve special mention. The latter is likely to be needed when there is an unusual degree of suffocation, anguish and oppression of the chest. Palpitation, pronounced dyspnoea, labored breathing, cringing as if there were pain about the heart with violent heart action, call for *Cactus*. *Arsenicum* has also distress and anguish for fear of suffocation. Each paroxysm of cough is followed by great exhaustion and increased difficulty in breathing, the cough is worse in the fore part of the night, at which time will occur the characteristic sinking of the vital forces belonging to this remedy. *Arsenicum* is especially to be thought of in association with bronchitis; there is a severe degree of relaxation, vomiting and diarrhea. *Lycopodium* is a capital remedy in the severe bronchitis of children with sustained paralysis of the lungs or collapse of the air cells, as shown by the wheezing breathing of the chest, distension of the alveoli nasi, inability of the child to cough or expectorate, with complete exhaustion. The *Lycopodium* child doesn't suffer the anxiety and restlessness of the *Arsenicum* case, but is weak and flabby and seems unable to get its breath because of this debility and apparently from closure of the air vesicles; the respiratory murmur is decreased in area nor is there the rattling of the mucus that belongs to *Tartarus emeticus* or even to

Hepar sulphur. When the physical signs point clearly to impending lung collapse or lung paralysis *Lycopodium* should not be forgotten.

The general management of capillary bronchitis demands uniformity of temperature, admission of plenty of fresh air to the sick room, support of the patient by liquid nourishment, and in occasional cases the exhibition of medicated steam by inspiration. The proper temperature is about seventy to seventy-six degrees, according to the disposition and temperament of the child. When the cough is unusually harsh, dry and spasmodic, the moistening of the atmosphere or the breathing of steam from an atomizer—or even the ordinary tea-kettle—will assist in loosening the cough, and overcoming its spasmodic character. Glycerine may be added to the boiling water for the purpose of making the expectoration easier, but medicants generally are to be avoided. The cold pack sounds harsh for these cases, but in the initial stage often serves an excellent purpose, cutting short the course of the disease. As cyanosis is manifested in the extremities, and the limbs and feet show an uncounting coldness they should be frequently bathed in hot water and wrapped in hot flannels, thus relieving the engorgement of the chest. If the child is disposed to thrash about and thus become uncovered it should be warmly wrapped and dressed so that its body and limbs will be protected. Every effort should be put forth to prevent the taking of cold and consequent aggravation of the disease.

CHAPTER LXXVII.

CHRONIC BRONCHITIS.

General Considerations—Course and Prognosis—Treatment—Specific Medication.

General Considerations.—Chronic bronchitis occurs as a result of acute attacks of bronchitis and also as a result of other diseases of the lungs. It is almost constantly seen in association with pulmonary tuberculosis and chronic pleurisy, especially when fusion into the pleural sac, which has become purulent, has taken place. Chronic bronchitis is also seen in association with diseases of the heart, kidneys and liver, and in children it follows also upon acute exanthemata that appear together, spending their efforts upon the skin. When it occurs as a sequence of acute bronchitis the latter disease is never really cured, the case passing from the acute into the subacute and finally into the chronic stage by a continuous history. In delicate children, especially those phthisically inclined, it is often intractable, extending over

a period of many months. It belongs to all ages, but is more often seen in children about the age of puberty when "galloping consumption" or *phthisis florida* is threatening.

The distinguishing features of chronic bronchitis are the cough and the respiration. The cough is not as severe as in the acute form of the disease, but is persistent and continues over long periods of time. In some cases it is severely paroxysmal, especially in those that follow upon whooping cough or suppressed measles, but as a rule it occurs easily as though excited by the bronchorrhea that is constantly going on. If the condition of the bronchial tubes be that of dryness and partial atrophy of the bronchioles and membrane the cough will be irritating in character, more persistently teasing than when it is moister. It is not especially attended by shortness of breath unless severe and protracted. When this is the case there will be about the same degree of dyspnea and palpitation that attend upon physical debility from other chronic disorders.

The expectoration of bronchitis depends somewhat upon the character of the case. In some it amounts to bronchorrhea, consisting of fine thready matter of which there may be considerable quantities expectorated during twenty-four hours. It is especially copious in the morning from the accumulation that has taken place during the night, and comes away easily, the cough not being especially harassing. In some cases the quantity of mucus that is secreted by the tubes is sufficiently great to excite vomiting as it is thrown off, coming away in considerable quantities, even as much as a quarter of a teacupful at a time. If the inflammation has attacked the finer bronchial tubes there is less apt to be expectoration, and the dyspnea and chest distension are pronounced. This is much more likely to follow upon repression of eruptions than where the case follows upon the course of acute bronchitis.

In some cases chronic bronchitis assumes a putrid form and the symptoms that are associated with it go to indicate that it is of septic character, occurring in the course of ordinary bronchitis, especially when this follows upon other acute diseases. The patient will be attacked by chilly sensations, followed by sudden increases of temperature, headache, flushed cheeks and expectoration of a considerable quantity of peculiarly offensive expectoration that, while intensely offensive, is possessed of a sweetish odor. The expectoration may be greenish or yellowish, and thick or watery and flaky in character. In pronounced cases the odor from putrid bronchitis permeates the whole house. The expectoration occurs as a result of severe gagging spells, evidently from closure of the bronchial tubes by the firm collapse of the muscles, below which the secretion forms and is retained until it becomes putrid, this resulting in permanent dislodgment of the flakes, which are

thrown off together with the bloody matter in the violent paroxysms of coughing. Cases coming under my observation have been so severe that as much as half a pint of disgustingly offensive matter was ejected in a single vomiting spell, the pus coming so violently as to be ejected from both mouth and nostrils. These cases are commonly mistaken for abscesses of the lung, the error arising no doubt from the fact that almost a counterpart of the condition is seen in association with acute consumption with lung vomica. Patients who are the subjects of the putrid variety of bronchitis are generally of phthisical history and in a low state of health. While perhaps seen more often in adults than in children yet it is not an uncommon ailment in young subjects who have not fully recovered from measles, whooping cough or small pox, and in whose genealogy is a consumptive history.

Course and Prognosis.—This form of bronchitis may come on suddenly, and in fact, is apt to do so if dependent upon any of the acute, eruptive diseases as its cause; or it may come on slowly as a sequela of bronchitis that has not been wholly cured. It is apt to pursue a protracted course and is exceedingly difficult of treatment. Even if apparently wholly cured it may burst forth as badly as ever weeks or even months after its apparent complete subsidence. It shows repeated exacerbations and remissions and in certain subjects may last over a period of years, making its victims an offense to themselves and their friends, the putridity finally becoming almost a part of themselves. These cases are not very often met with, and fortunate is it that this is so. The lung parenchyma gradually becomes involved, doubtless from septic invasion, the case taking on the general symptoms of hectic, and becoming gradually debilitated into a state of almost hopeless invalidism unless relieved by treatment and climatic change. If so essentially fatal complications arise, as acute pneumonia, empyema and general sepsis, from which the patient sinks into a hopeless decline, the rule is for the case to drag itself out over a long period of time with eventual partial or even complete recovery.

Treatment.—Chronic bronchitis, whether of the simple or putrid variety, will need long continued constitutional treatment. It may be stated as axiomatic that it is based upon constitutional dysæmia, usually tuberculosis, hence the necessity for the administration of *Sulphur*, *Calcareo*, *Parisium*, *Tuberculinum*, *Silica*, *Kali carbonicum*, *Arsenicum*, *Thuja* and other anti-psoric remedies. *Lycopodium* is an excellent siege remedy for chronic bronchitis of children, especially when occurring in young girls or when following upon acute exanthema, particularly measles.

Acute bronchitis also demands climatic change. It is much more commonly seen in colder and damp climates, and it is often sufficient to remove the patient to a dry atmosphere, in a climate

possessed of some elevation, to properly bring about recovery. Subjects of chronic bronchitis in child-life are those in whom phthisis pulmonalis is very likely to be developed at the age of puberty or in early adulthood, and these patients had best be removed permanently to the best possible available climate. As stated in the chapter on tuberculosis, Southwest Texas, New Mexico, Arizona, South California and perhaps individual localities in Florida and the Carolinas offer the most satisfactory inducements. I am firmly convinced that all children possessed of a bad family history and starting off in life with a tendency to bronchial cough should be reared in a mild climate, and thus to be given the best possible chance for long life and elimination from the family tree of the tendency to lung disease.

Next in importance, and perhaps superior to climate, is nourishment. These subjects require concentrated nourishment that is easily digested and assimilated. Gastro-intestinal disorders are common in bronchitic subjects—especially so is atonic dyspepsia. Bronchial children are generally dainty feeders, their bodies are ill-nourished, they are lean, lank and emaciated. The gastric membranes and secretions partake of the general disturbance of the system and are incapable of their functions, hence the stomach becomes distended with gas, there is more or less of gastric distress, anorexia is an invariable accompaniment, and either constipation or diarrhea is the rule. The diet should be of the most nutritious character. If it agrees pasteurized milk should be used freely, but as a rule it doesn't agree, and it will be necessary to resort to a meat diet, nourishing beef soups and liquid nourishment generally. Because of the impairment of the digestive faculties it is wise to give meats that have already undergone stomach digestion in the chemical laboratory, as beef peptonoids, or to add to the diet peptonized powder to assist the digestion. Soups from peas, beans, lentils and other nitrogenous vegetables should be freely given. If the child is old enough to take it without detriment a little red wine may be administered at meal times to assist digestion of the food. Squibb's Cod Liver Oil and Angier's Petroleum Emulsion are also beneficial. Care must be given to the diet, climate and hygienic treatment in incipient phthisis.

SPECIFIC MEDICATION.—Besides the constitutional remedies already mentioned, which as indicated will form the basic treatment of chronic bronchitis, *Hepar sulphur*, *Stibium*, *Arsenicum*, *Phosphorus*, *Pulsatilla*, *Ipecac*, *Shallown*, *Kremsdorf*, *Baryta* and *Carbonica* will be demanded.

Sulphur is especially the basic remedy in confirmed bronchitis with suffocation, pains in the chest, with general *Sulphur* acraeniety and unhealthiness of the skin, lankness of the subject, unhealthiness of the hair, and positive *Sulphur* constitution. It

should be administered in moderate or high attenuation and oft repeated.

Phorrasia is very much like *Sulphur* in its general constitutional indications, but is especially to be thought of in connection with the putrid variety, the expectoration being so putrid as to penetrate the whole house and cling to the child, its clothing and bedding for hours.

Calarea is the basic remedy for chronic bronchitis with fetid sputum, but it is not so offensive as *Phorrasia*, the expectoration being thick, yellow, sweetish and offensive; that of *Phorrasia* more liquid, of dirty color, watery and fetid to rotteness. The *Calarea* child is pale, its light hair and blue eyes, lymphatic temperament and characteristic *Calarea* relaxation standing forth prominently as features in its make-up.

Calarea foliata is very like *Calarea carbonica* in its pathogenesis, but is better suited to children whose glands are swollen, who are thin and scrawny, in whom the cough is dry rather than moist, and in whom chilliness and pain are pronounced, as though the bronchial glands were swollen.

Cresotum is useful in spasmodic cough in children whose teeth show early decay, whose heads are large, necks scrawny, and who are the opposite in temperament to the *Calarea*-child.

Södra should be selected according to the constitution of the subject; for rachitic children who are awkward and ungainly, whose heads are large, with muscular plumpness, and chest emaciation. Dyspnea and weak heart action belong to *Södra*, which has also hectic flush, nightly perspiration about the chest, with copious, transparent or purulent expectoration.

Stannum is required when, in association with bronchitis, the asthmatic symptoms are pronounced. Whistling, wheezing breathing, difficult expectoration, cough worse at night. Nightly attacks of asthma requiring that the child be fanned or taken to an open window in order to get breath.

Lycopodium will be found useful in bronchitis following upon measles or whooping cough in tall, phthisical, emaciated subjects. Unhealthiness of skin and glands. Stoop-shouldered children with narrow chests and difficult breathing, with general languor and atonic dyspepsia; bronchitis in which the expectoration is thin and yellow and moderately offensive.

Besides these remedies *Darya*, *Kali carbonicum*, *Hepar sulphur*, *Mercurius*, *Stönum*, *Phosphorus*, *Sanguinaria*, *Cauticum* and *Arsenicum* will be required in individual cases. The range of remedies covering bronchitis is extensive, yet those named will meet most cases, and if promptly and persistently exhibited will usually give gratifying results.

CHAPTER LXXVIII.

PNEUMONIA.

General Considerations—Etiology—Morbid Anatomy—Complications—Symptoms and Course—Inspection—Percussion—Auscultation—Diagnosis—Prognosis—Treatment—Hygiene—Bathing—Diet—Medication—Convalescence.

General Considerations.—Pneumonia is an infectious disease characterized by inflammation of the parenchyma of the lung, and may involve both lungs, an entire lung, a lobe of either lung, or occasionally present as a circumscribed process involving a limited number of lobules. As a rule it is confined to one entire lobe, but, unfortunately, often presents as an acute inflammation of almost the entire structure of either lung, while the secondary infective process may involve the pleura, pericardium, endocardium and even membranes of the spinal cord and brain.

Etiology.—Whether due to the pneumococcus or not is not fully determined, but the diplococcus pneumoniae is invariably found in the lung affected, and is also seen in the brain and meninges, or the fluid effused therefrom, when these tissues are secondarily involved.

Pneumonia is accounted one of the most widespread of all acute diseases. It forms from two to three per cent. of all hospital admissions, acute and chronic, and in winter seasons admissions from this cause are greater than from all other acute diseases combined. It attacks all ages, though most often seen in young children and old subjects. It is met more frequently in cities, among those who are poorly clad and whose sanitary surroundings are not of the best, and is oftenest seen in individuals predisposed to tuberculosis. Weak, anemic children and those who are begotten of alcoholic parents are also ready subjects of pneumonia. It is common to the infectious fevers, as a complication or sequel, being seen most often in association with measles as a complication and with whooping cough as a sequel. Scarlet fever, diphtheria, typhoid fever and cerebral-spinal meningitis also predispose to pneumonia.

One attack of pneumonia seems to predispose to subsequent attacks, the lungs being left weakened or impaired by the first illness. Some subjects are so susceptible as to have pneumonia, either circumscribed or general, almost every severe winter, to eventually die of the disease or to drift into phthisis pulmonalis. It prevails in all climates, being most often met with in changeable climates, less commonly in the extreme North and still less commonly in the extreme South. But in middle zones in which

winter weather is changeable, thawing one day and freezing the next, and where the "spring break-up" is severe, it is seen more frequently than in climates whose seasons are more settled. As is to be inferred, it is commonest during the latter months of winter, and in the midst of the winter season rather than in the spring, summer or fall. In some winter seasons it is very prevalent and in others is not met with. It is seen more frequently in low altitudes, with humidity of atmosphere, than in high, dry climates. Intense cold will occasionally seem to set up an epidemic of pneumonia, but a combination of moderate cold with raw, damp winds is almost certain to be followed by more or less prevalence of this disease. It is occasionally, though rarely, seen in hot countries, following upon sudden changes of the weather; and while malaria has, perhaps, no direct causative relationship, yet it is a clinical fact that in malarious districts it occasionally appears in epidemics during changeable weather.

Until within recent years it has been almost universally regarded as being due to taking cold, and it is difficult to explain many cases upon any other hypothesis. A child may be perfectly well, playing actively until he perspires freely and develops acute pneumonia within a few hours from sudden suppression of the perspiration, or from exposure to raw, damp winds, or getting the feet wet in icy water, or playing in the snow while heated. It appears difficult to reconcile the microbic theory of origin of the disease to these facts, and I am not ready to believe that it is invariably due to a specific micro-organism that causes pneumonia and nothing else. Yet the generally accepted opinion at this time is that pneumonia is a specific infectious disease. The fact that it occurs in epidemics, or at least in epidemic form, seems to support this view, and the fact that repeated attacks of pneumonia are seen in individual houses and hospitals seems also to support the thought. The occurrence of pneumonia in prisons, camps and foundling asylums, a considerable number of cases occurring at one time or in quick succession without definable cause, goes to prove the theory that it is due to a specific organism that attacks considerable numbers of persons simultaneously, and it is from this fact that it has come to be the accepted view among bacteriologists that the diplococcus pneumoniae of Frenkel, which seems to have the lung as its seat of election, is responsible for pulmonary inflammation. The pleura, meninges and heart membranes may, however, be the site of attack of this microbe without the lungs being involved, since it has been found in meningitis and pleurisy quite independent of pneumonia. It is seen in association with pus and saliva, and, injected into lower animals, as the guinea pig or rabbit, will produce septicemia. A peculiar feature in connection with its presence in the human family is that it may be found in the buccal secretions for months or even

years after an attack of pneumonia, as though it still thrived in the lung tissue and was thrown off in considerable numbers on the breath. The fact that individual subjects are liable to repeated attacks is argued to show that the diplococcus serves as a causative factor, the patient perhaps never having altogether got rid of the colonies which were developed in the first attack.

An additional argument in favor of the infective nature of pneumonia is presented in the claim made by Leyden that immunity is obtained in animals by subcutaneous or intravenous injections of considerable quantities of filtered bouillon cultures, the immunity rarely lasting more than six months, but transmitted to offspring born within that period. Experiments along the line of the anti-toxine treatment of diphtheria are being developed with the poisonous output of the pneumococcus, called pneumotoxin, which, introduced into the circulation of the animal experimented upon, seems to possess the power of neutralizing the poisonous albumin formed by the bacteria. These experiments have not been sufficiently practiced to justify positive conclusions therefrom, nor is it believed that very much will be accomplished along this line. The manner in which the pneumococcus, if indeed it is the cause of pneumonia, develops increase of temperature and the pathological changes that take place in the lungs, is not yet fully understood, though believed to be in a great measure due to the production of a tox-albumin as a result of the destructive work of the specific micro-organism. If this conclusion be correct it is easy to understand how the neutralization of this tox-albumin, no matter how produced, must act prophylactically at least, thus preventing the further spread of the disease process, and it is not unreasonable to believe that it may act curatively as well. The theory is certainly not far removed from the law of similars, and it may be well for us to not too hastily reject it.

Besides the causative factors that have been already mentioned, pneumonia may be the result of injuries to the chest and the introduction of foreign substances from the atmosphere. It not infrequently follows, though more especially in adults, upon the occurrence of hæmorrhage from the destructive processes belonging to tuberculosis, though it is not unlikely that when lighted up in a tuberculous subject it is due to an extension of the phthisical state rather than to the shock the lung is made to feel because of its blood loss.

Morbid Anatomy.—Three distinct stages are recognized as taking place in the diseased lung. First, engorgement; second, red hepatization or consolidation; and third, gray hepatization, or the process of resolution or diffuse suppuration.

The characteristic condition of the first stage of the lung is more or less of intense congestion. The capillaries of the alveolar walls are dilated and tortuous, and minute hemorrhagic spots are

seen in the inter-lobular spaces and often in the sub-pleural connective tissues. If the lung could be seen at this time it would be found to be deep red in color, firmer than normal to the touch and more solid, while the surface of the incised section is bathed with blood and serum. Air still circulates through the air cells in this stage, and the sputum is more or less impregnated with air bubbles. As the congestive stage advances the lung grows heavier, and in severe cases becomes reddish brown or purplish in color. If a post-mortem is held during this stage it is found that fragments of lung if thrown in water will still float, from the presence of air in the vesicles and because the consolidation is not yet completed. Microscopic examination shows the fluid that exudes on the incised surface to be charged with granular epithelial cells and blood corpuscles, both red and white.

In the stage of consolidation the air vesicles become completely expanded and are occluded by a fibrinous exudate. During this stage, which is termed that of red hepatization, the lung tissue is firm, solid and altogether unoccupied by air. The consistence of the tissue is much like that of liver, though it is paler than normal because of the anemic condition resulting from the pressure of the fibrinous exudate upon the blood vessels of the alveolar walls. If the entire lobe is involved it looks swollen and engorged, and shows the indentations of the ribs on its surface. Upon section this is dry, reddish brown in color, and less deeply congested than in the first stage, showing a well-marked granular appearance. When the fibrin exists in large quantities it presents throughout the tissue in tree-like ramifications, giving a characteristic appearance to the microscopic field (Goodell). The air cells are seen to be occupied by the coagulated fibrin, the alveolar walls are infiltrated and leucocytes are seen in the inter-lobular tissues. In the coagulated fibrin are to be seen red blood corpuscles, leucocytes and alveolar epithelium.

The stage of gray hepatization, or third stage, is characterized by a change in color from the reddish brown of the second or red hepatization stage to a grayish white; the cells are moister, the exudate is more turbid, the granules are less distinct and the lung tissue more friable. The lung may preserve many of the characteristics of the second stage. It is increased in weight, transmits crepitus on pressure, and retains its liver-like consistency. The change in color from reddish to grayish is due to the pressure of the exudate, the destruction of red corpuscles within the alveoli and the presence of a considerable number of leucocytes. Histologically it is seen that the air cells are filled with these and that the fibrin network and red blood corpuscles have disappeared. Later on, the cut surface of the lung is found to be soft and bathed with a purulent fluid, giving to the lung the condition known as purulent infiltration.

In children the change from one stage to another is rapid and not always pronounced. Portions of the lung may still present symptoms of the first stage, or more especially of the second, and other portions be further along in the pneumonic process, even to pronounced gray hepatization. In cases that do not pass on to the well-defined third stage resolution occurs. Just how this takes place is not understood; but instead of the pathological process showing as purulent infiltration it seems to cease at red hepatization, the exudate is softened, and the cell elements are disintegrated and absorbed. Examination of the bronchi shows their mucous membrane to be reddened, but generally not much swollen. The small bronchi contain fibrous plugs. If these extend into the larger tubes they form perfect casts of the portions occupied by them. The bronchial glands are swollen and softened—in rare cases, especially in phthisical children, going on to suppuration. Inflammation of the pleural surface of the infected lung usually involves the pleura. Sometimes there is but a thin sheeting of exudate thrown out on the lung surface of the pleura, with slight turbidity of the membrane, while in other cases it forms a thick, creamy layer, resulting in adhesions and perhaps in empyema, or in pleura effusion resulting in suppurative pleuritis.

Complications.—Pneumonia is very apt to be attended by lesions of other organs, the heart especially being involved in endocarditis, although pericarditis is more commonly present than is often supposed. In severe cases the heart muscle becomes involved in the secondary process and severe parenchymatous changes are found post-mortem. The right chambers of the heart are often found to contain coagula which are softened and pale and may extend for some distance into the blood vessels. The heart cavities rarely contain thrombi. Pericarditis is seen more often in association with pneumonia of the left side or with double pneumonia; it is not apt to be present when the right lung alone is involved. Endocarditis is seen about three times as often as inflammation of the pericardium, and fatty degeneration of the heart is limited to long protracted cases in child-life, to those that are secondary to other acute diseases and to those that are phthisically disposed.

More rarely meningitis is seen in association with pneumonia, especially the tubercular variety in tuberculous children, and here the pneumococcus is found not only in the lungs but in the meningeal effusion. The kidneys, liver and other organs may be affected by congestion, softening or parenchymatous degeneration. Catarrhal inflammation of the gastro-intestinal tract is not uncommon in children, especially in association with pneumonia.

Symptoms and Course.—Pneumonia is usually ushered in suddenly, although there may be certain prodromic symptoms, as malaise, slight oppression of the chest, moderate elevation of the

temperature, preliminary chilliness, and a slight degree of congestion of the liver. As a rule these symptoms, if present at all, last but a day or two, but in cases of slow invasion the patient may drag along for several days or a week before the pneumonic process fully sets up.

The invasion is generally pronounced and in no acute disease is the initial chill so invariably present or more severe. The chill may last but a few minutes, or in severe cases may be violent and continue for half an hour or more, attended with profound shock to the nervous system, general coldness, severe depression of the pulse, and depression of the temperature from half a degree to a degree below normal. Following upon the chill the temperature rises quickly to 103, 104 or 105 degrees. A short, dry, painful

Temperature charts in Pneumonia, *erysipelas*.



FIG. 70.

cough is present during the chill or follows soon after its subsidence, the respirations are increased in frequency to twice the normal number or more, and agonizing pain in the side or over the chest soon develops. In most cases the temperature reaches its highest elevation on the first or at furthest on the second day, holding there with slight variability until the sixth or seventh, when it suddenly falls to normal or thereabouts if the case does well. If it rebound it is more than likely that a new focus of inflammation has been established, or that there is an extension of the primary inflammation; and the case again goes through about the history presented in the first week. With the sudden rise of temperature the pulse is full, rapid and bounding. The face is flushed, especially the cheeks, the breathing is rapid and difficult; the eyes are abnormally bright and their expression one of anxiety; there is frequent short, sharp painful cough from which the patient shrinks, and that causes him to toss restlessly with pain, or to lie quiet and restrain himself as much as possible in order to avoid the suffering.

The temperature does not always rise as rapidly in children as in older subjects and adults; yet in acute cases in children of full habit it may go with a single bound five or six degrees above normal in the course of a few hours. A crisis may occur as early

is the third or fourth day or may be postponed until the end of two weeks, although it usually occurs about the seventh or eighth day, when the temperature falls abruptly as much as six or eight degrees in the course of eight or ten hours. In special cases, instead of this sudden crisis defervescence takes place more gradually by lysis, in which event the fever may drag along for a number of days before the return of normal temperature.

The pain of pneumonia is an early and distressing symptom, usually referable to the nipple or the region of the arm-pit. It is always aggravated by coughing, and efforts at deep inspiration not only increase the pain but the cough as well. The breathing is usually very rapid in children, corresponding as a rule to the elevation of temperature, often attaining the rate of from sixty to eighty per minute. The inspirations are short and superficial and expiration is apt to be attended by a short, groaning murmur. The ratio between the respirations and pulse is exceedingly characteristic, so much so as to assist materially in making the diagnosis of pneumonia. In many cases the pulse is about twice as rapid as the breathing, while in others it is about one and one-half times as fast.

The cough is at first hard and dry and not attended by expectoration. It is frequent, short and painful. If expectoration occurs the sputum is viscid, tenacious and tinged with blood. It is this characteristic sputum that bears the name of brick-dust or prune-juice expectoration. It is so viscid and tenacious that it is expectorated with difficulty. Toward the close it becomes more liquid and is more readily thrown off. As the case progresses it loses the brick-dust color and becomes more mattery in color and character and quite copious in quantity. If examined under the microscope the characteristic sputum is seen to contain red blood corpuscles, alveolar epithelium, diplococci and other micro-organisms; sometimes fibrinous casts of the bronchioles are fully large enough to be visible to the naked eye (Osler).

INSPECTION.—If but one lobe is involved in the inflammatory process there is less movement of the affected side, easily discoverable by examining the chest carefully. As consolidation occurs, especially if it be extensive, the immobility is increased. If both lungs are involved the difference in mobility of the two is not so pronounced. Examination by palpation assists in determining the degree of immobility, and by this means it is often possible to detect the pleural friction sound, present when inflammation of the lung and pleura are combined. If the degree of consolidation is pronounced the evidences of immobility and friction, together with increase in volume of the side involved in the inflammatory process, are more certainly established.

PERCUSSION.—In the first stage, or stage of engorgement, the percussion note is higher than normal, and is somewhat tympan-

ific above the consolidated area. Over the hepatized portion the percussion note is flat, varying in quality from simple tympanitis to absolute dullness. The dullness is not so pronounced as in effusion, nor is the sense of resistance so great. The tympanitic quality of the percussion note is very likely to remain as resolution goes on, though in special cases that drag along slowly the percussion note of the affected side may be higher than normal, extending over a period of several weeks. The more pronounced the consolidation the flatter the note. In the third stage it varies, depending upon whether resolution is taking place or purulent infiltration is occurring.

ATSCILLATION.—The breathing is somewhat suppressed in pneumonia and at the end of inspiration there is heard a fine crepitant rale close to the ear and perhaps not observable except upon deep inspiration. This is not unlike pleural crepitus, but emanates from the air-cells and finer bronchi. The breathing is feeblier than in health and on taking a deep breath it seems to have a harsh quality, to which the term broncho-vesicular murmur has been applied (Osler). After the stage of red hepatization has set in and when dullness is pronounced over considerable areas of lung tissue the respiration is more tubular in character, more so than in any other pulmonary affection, with perhaps an entire absence of rales, due to the consolidation of lung tissue, and the propagation of the laryngeal and tracheal sounds on through the bronchi and consolidated lung tissue. If the larger bronchi are filled with exudative secretion this tubular breathing is not so observable. As resolution sets in and mucus begins to form mucous rales are heard throughout the entire lung.

Diagnosis.—The diagnosis of pneumonia depends in good part upon the physical symptoms just described. The character of breathing, the pain, cough, pulse and temperature, all have their bearing in making a picture. The sputum, combined with the physical signs, leaves but little room for mistake. In children pleurisy with effusion is sometimes mistaken for pneumonia, where effusion occurs promptly and extends over a considerable area of lung surface. The great danger of mistake in child-life is the masking of the pneumonic inflammation by the cerebral symptoms. Where the brain is considerably involved interer headache is common and in children convulsions are seen to usher in at least one-half of the cases. Where the headache is severe, and especially if spasms ensue, the lung may be entirely overlooked. Pleurisy with effusion is confused with pneumonia in children because of the presence of similar physical signs. Although the breathing may be tubular in character, as in consolidation of lung tissue, the fremitus may still be present. The difficulty of diagnosis is so great in individual cases as to require the aspirator to decide the question. Pneumonia is sometimes confounded with

rapid phthisis, but this mistake ought never to occur. Children suffering with typhoid fever, with the dry, bronchial cough so often associated with that disease, are sometimes pronounced ill with pneumonia, but the association of pneumonia with true typhoid fever is not common. Pneumo-typhus is seen when the typhoid fever sets in with the symptoms of lobar pneumonia, but the cough that develops as typhoid fever progresses is much more likely to be from involvement of the bronchial glands than from the lung parenchyma. The rust-colored sputum is a clinical feature of importance, and is not seen with other types of lung disease. Herpes sometimes occurs upon the face, especially about the mouth, in pneumonia, and, in association with its other distinct symptoms, is confirmatory evidence of the presence of lung inflammation. Rales are to be heard in pneumonia in the lower lobes of the lungs, over lateral portions of the chest and the axillary region, and also over the posterior portion of the upper lobes when the apex is first involved. These rales are easily discoverable in children, provided reasonable care be exercised in making the examination. The rapid respiration is a pathognomonic symptom, and the disturbed pulse-respiration ratio is not present in any other disease.

Prognosis.—Pneumonia is among the most fatal of acute diseases, especially in the later years of life. Among children its mortality is not so great, yet is sufficient to class it among the severe diseases. In very young children its mortality is high, but when it comes as a primary ailment in healthy children about three or four years of age the prognosis is favorable. If both lungs are involved the mortality is greater than where a single lung is affected. In fact, the danger depends in great part upon the amount of lung tissue actually inflamed, and the best guide to the lung condition is the rapidity of respiration. In delicate children the mortality is larger, and in those who are already suffering from chronic bronchitis or heart disease, or who have just recovered from whooping cough or measles, the fatality is great. Pneumonia often serves as a stepping stone from whooping cough or measles to phthisis pulmonalis, the patient not fully recuperating from the primary acute infectious disease before pneumonia sets in, never fully recovering but gradually drifting along until phthisis pulmonalis of the caseous variety is fully established. Unfavorable symptoms are extremely rapid respiration with irregularity of pulse, bad heart action, cyanosis, suppression of expectoration and severe cerebral symptoms.

Treatment.—If there be a disease in which the results of homoeopathic treatment as compared with those of the old school treatment are satisfactory, that disease is pneumonia. Osler is responsible for the statement that "pneumonia is a self-limited disease and runs its course uninfluenced in any way by medicine."

It can neither be aborted nor cut short by any known means at our command." This statement is so exactly at variance with the testimony of homoeopathic physicians, whose word is considered equally reliable with that of Osler or other old school authorities, that we are justified in making the statement that homoeopathy is far superior as a system of medication in this, as in many other diseases in which the helplessness of the old school is freely acknowledged. For the clinical course of pneumonia clearly shows that many even severe cases, that seem to threaten disastrously, may terminate favorably, and it is a fact that the ordinary course of pneumonia can be modified and abbreviated in almost every instance if proper medication be applied early. Just why this disease should be abandoned to its unrestricted and natural terminations is not clearly understood.

HYGIENE.—Important in the treatment are the general care of the patient, the hygienic surroundings and the diet. The sick-room should be well ventilated and be, preferably, an up-stairs room. In severe cases, characterized by unusually harsh, dry cough, it may be advantageous to secure a certain degree of humidity of atmosphere by means of steam, either from an atomizer or from the evaporation of boiling water in an open vessel. Generally, however, this is not necessary, and as there is some danger of the patient's taking more cold by virtue of this humidity it should be practiced in extreme cases only.

The pneumonia patient should be promptly put to bed and kept there in a recumbent posture during the entire course of his ailment. The more natural and easy the circulation of blood through the lungs and general system the less likelihood of pulmonary thrombosis and engorgement, and either cerebral anemia or hyperemia. As a rule the dorsal posture is preferable, but if only one side is affected the patient may lie upon either side as he may prefer. Generally this will be the affected side. Frequent changes of position, especially to the upright posture, efforts at conversation, in fact all movements and exercise, should be interdicted. The quieter the patient is kept the more prompt and satisfactory will be his recovery.

BATHING.—Baths are permissible during pneumonia, as in other acute fevers, according to the judgment of the physician. If the temperature be exceedingly high, the skin hot, dry and parched, frequent sponge bathings are grateful and helpful. In the onset of pneumonia the wet pack is an adjuvant of value. If the engorgement be extensive, the temperature high and the patient threatened with convulsions it should be applied immediately and repeatedly every half hour or hour until the dangerous symptoms have subsided. In a recent contribution to the *MEDICAL CENTURY*, Dr. J. C. Daily, of Fort Smith, Arkansas, accords it extravagant praise, relying upon it in almost every case of

pneumonia in the first stage. Punctures and hot fomentations on the affected side have long been used in domestic practice by the profession. It is doubtful if they are beneficial, but the loosely quilted cotton jacket, made by stitching cotton batting on oiled silk, should be applied in all cases of true croupous pneumonia and continued throughout the course of the case. This prevents chilling of the chest and promotes moderate respiration. Where the cotton jacket is not accessible the chest should be protected by a closely-fitting flannel undervest; and an outing-flannel nightdress, extra long and with long sleeves, should be worn throughout the course of the disease.

Diet.—The diet should be light and nutritious, easy of digestion and, in children especially, almost exclusively liquid. In subjects with whom it agrees milk affords the best diet, but it should never be given raw nor boiled, simply pasteurized, and, if necessary, peptonized. Koumyss, milk-whey, weak mutton-broth, weak beef-broth, made in an open vessel, barley gruel to which Valentine's beef juice, Bovinine or Murdock's liquid food has been added, are also permissible. In young children rice with cream, the various gruels, Mellin's food, Imperial Granum and other like preparations may be required. As convalescence sets in a more liberal and nourishing diet is permissible. Pneumonia patients are usually thirsty and should have water ad libitum, pure, cool, fresh water, preferably water that has been sterilized, subsequently cooled and kept in closed vessels. Weak lemonade, orange juice, grape fruit, the juice of pineapples, and other acidulated drinks are refreshing and allowable.

The bowels will usually take care of themselves, but if a patient be especially constipated, and headache and fever be aggravated thereby, the rectum should be emptied by enemata of cold water, which not only relieve the bowel but are grateful to the system. Where the patient is dull and listless, lying in an apathetic condition, it is often desirable to copiously flush the rectum and colon with considerable quantities of cold water, much of which will be absorbed into the system. In apathetic cases the bladder will also need attention, the patient oftentimes not experiencing a desire to void urine, and the bladder becoming enormously distended. In especially dull cases the catheter may be required.

Stimulants.—The question of stimulation in pneumonia is one that has received a great deal of consideration at the hands of the profession and on which there is a great difference of opinion. It is not my practice to use stimulants. I look upon alcohol as an irritant rather than a stimulant, in the true sense of the word, the use of which is always followed by depression, and as, therefore, in the end more harmful than beneficial. If the digestive powers be very much impaired, and the liver be apparently unable to perform

its glycogenic function and to otherwise perform its duties as a scavenger, it may seem desirable to occasionally administer a few drops of pure alcohol, either dilute with water or with milk or other nourishment. The use of whisky and brandy ad libitum in pneumonia is to be condemned. Even when "heart-failure" is threatened it is more satisfactory and promptly advantageous to administer the properly indicated constitutional remedy, together with hot liquid nourishment that is capable of quick absorption, and that will be found to be more promptly beneficial, than to rely upon alcoholic stimulants, which at best but tide over a brief period of time. The beneficial effect of alcohol is exceedingly transient, while its injurious effects are more permanent. Weak egg-nog or milk-punch, combining stimulation and nourishment, if it be admitted that alcohol is a stimulant, may be required in individual debilitated subjects; but further than this it is not likely that alcohol is ever needed in the pneumonia of children; and, in fact, it is exceedingly doubtful if we are ever justified in administering it in any form in this disease. The temperature is usually elevated by it, the heart excited and the nervous system irritated. These symptoms are almost certain to be followed by a corresponding depression, and in the end the administration of alcohol is, in my judgment, certain to be harmful.

MEDICATION.—The first stage of pneumonia calls for *Aconite*, *Belladonna*, *Veratrum viride*, *Bryonia*, *Ferrum phosphoricum*, and, in malarious districts, *Gelsemium*. Later the remedies are *Phosphorus*, *Tartarus emeticus*, *Caprum*, *Sanguinaria*, *Arsenicum*, *Antimonium*, and, in special cases, *Baptisia*, *Lycopodium*, *Asclepias tuberosa*, *Kali muraticum* and *Lachesis*. If engrafted on a toxic base *Sulphur*, *Lycopodium*, *Silica*, *Kali carbonicum*, *Calcarea carbonica*, *Psorinum* and, perhaps, *Tuberculinum* may have to be exhibited at some time during the course of the disease.

There is no remedy better suited to the initial stage of acute pneumonia than *Aconitum napellus*. Its effects upon the nervous system and upon the circulatory organs are a counterpart of those seen in the stage of acute engorgement in pneumonia. The skin is hot and dry, the pulse is full, sharp and accelerated, the breathing is rapid even to panting, the patient is agitated and apprehensive, and the physical signs indicate pulmonary hyperemia or congestion. For the first twelve or twenty-four hours of the case, if it is seen thus early, *Aconite* is specially applicable, and capable of aborting the course of the disease and modifying its severity. It will not usually be required except in the early hours of pneumonia.

Ferrum phosphoricum follows *Aconite* when the intensely acute symptoms of the latter remedy have subsided, and is also suited to the cases lacking the sharp intensity of *Aconite*. From the first the expectoration is tinged with blood. There lacks the nervous apprehension of *Aconite*, but the breathing is oppressed, short and

panting. The skin is hot, but not so intensely hot as with *Aconite*. The headache is more continuous.

Belladonna is specially applicable to pneumonia in children, when ushered in with intense cerebral symptoms, exalted nervous sensibility, threatened convulsions, or a pronounced stage of congestion, with heat of the head, intense redness of the face and eyes, with coldness of the extremities. While it is the cerebral symptoms that especially call for *Belladonna* yet its chest engorgement and general circulatory congestion are typical.

Veratrum viride is very much like *Aconite* in its effects upon the circulation and heart. The pulse is full and bounding, more so than in *Aconite*, and the chest engorgement is extensive and severe. The delirium is less acute than with *Belladonna*, the whole picture being rather more passive than with this remedy or *Aconite*. Physiologically, in low attenuations or when administered crude, *Veratrum viride* relieves the high circulatory tension of pneumonia and induces a quiet restfulness and gentle perspiration that relieve the patient. The eyes are red and glistening in *Veratrum viride* cases and the tongue shows a red streak down its sides. There is little or no hepatization with *Veratrum*.

Bryonia is especially indicated in pneumonia after *Aconite*, when the skin is not so hot nor the face so red nor the patient so generally restless. There are sharp, stitching, pleuritic pains, with hard, dry cough and scantiness of expectoration. The patient prefers to lie perfectly quiet, and resists the cough as much as possible because of the pain it produces. The pain is better when the patient lies on the affected side, presumably because of the immobility thus secured. *Bryonia* is especially adapted to crupous pneumonia after *Aconite*, *Veratrum viride* or *Ferrum phosphoricum*, as well as in cases in which both lung and pleura are affected.

Phosphorus is useful in pneumonia after the subsidence of the acute stage when the bronchial symptoms are more prominent. The respiration is labored and the sputum rust-colored. The oppression of the chest is as if the chest were full of blood, causing oppression of breathing, or as if there were a load on the chest. In cases of pneumonia assuming typhoid condition *Phosphorus* is especially applicable.

Tartar emetic is often given in the first stage of pneumonia, but wrongly. It is especially indicated in the stage of resolution, when fine, moist rales are to be heard all over the hepatized portion. The breathing is oppressed, but not so much so as in *Phosphorus*, and the cough is attended by much rattling of mucus in the chest, which, however, is not expectorated. The skin is moist and cool and the patient is relaxed. There is some cyanosis, which, however, is not as pronounced as with *Belladonna* in the first stage. In broncho-pneumonia with a *low* *temperature*

cough, hurried respiration, crepitant rales and gastric irritation, *Stramonium* will be found to be an exceedingly helpful remedy. It is much abused in old school practice and is often carelessly administered in homeopathic practice. It is differentiated from *Ipecac* in the fact that its rales are fine and moist, while those of *Ipecac* are coarse and loose.

Sanguinaria is an excellent remedy in sharp, dry, bronchial cough in association with pneumonia. It is especially applicable to the stage of red hepatization in nerve-sanguine subjects who are sufferers from headache and constipation from torpidity of the liver. The fever is severe and long lasting, with burning and fullness of the chest. The cough is sharp, short and dry, with sharp, sticking pains and rust-colored expectoration. The pulse is quick, the face and extremities are inclined to be cold, or else the hands and feet are burning, with circumscribed redness and burning of the cheeks, worse in the afternoon. It is the severe harshness of the cough that leads me to choose it in the second stage of pneumonia. It is also applicable in the third stage, with dirty, offensive, brownish expectoration, offensive alike to the attendants and the patient.

Lycopodium is best adapted to cases that drag along over a considerable period of time and that are engrafted upon or follow measles; pneumonia in young girls of scrawny physique, who are tall out of proportion to their years, and of dyspeptic habits. The breathing is oppressed, and it is so difficult for the patient to get her breath that the alæ nasi are dilated forcibly with each inspiration.

Chelidonium is a remedy of much value in the so-called bilious pneumonia, with sharp stitching pains from the liver to the right scapula. The cough is loose and rattling, but expectoration is difficult. In the catarrhal pneumonia of young children it is very much like *Tartar emetic*, in that the chest seems full of mucus that is not easily expectorated. The intestinal membranes are dry and the patient excessively constipated.

Gelsemium is more likely to be required in the first stage when there is high fever without thirst, sighing respiration, pain under both scapulae, pulse short and full and not over rapid, and the patient suffering generally from weakness and malaise. The remedy is more likely to be needed in pneumonia seen in malarious districts, the fever assuming more or less of a remittent type. It is also applicable to pneumonia, ushered in with convulsions, rivaling *Belladonna* in this relation. In pneumonia resulting upon suppression of measles or other acute exanthemata *Gelsemium* will be found a remedy of much value.

Lachesis may be required where the disease assumes a low typhoid form, with abscess of the lungs; the lips and teeth are covered with sordes, the tongue is dry and brown, the patient is worse upon rousing from sleep, the general character being that

of a low grade of typhoid, with low, muttering delirium and hallucinations. The sputum is frothy and mixed with blood.

Besides the remedies whose symptoms are delineated above, *Kali carbonicum* may be called for when there are sharp, stitching pains over the anterior surface of the chest, especially over the left side and from below upward. *Digitalis* may be called for when the pulse is exceedingly slow and feeble, extremities cold and the face cyanotic. The expectoration is like prune juice and dyspnea is extreme. *Ipsac* is much like *Tartar emetic* and *Chelidonium* in the physical conditions, but the raies are coarse and lender and with efforts at expectoration there is vomiting. *Kali muriaticum*, according to Dewey, is suited to the pathological state of fibrinous exudation into the lung substance; the expectoration is white and viscid. *Sulphur* may be required when the case assumes a typhoid tendency and the lung tends toward breaking down. The tongue becomes dry, hectic symptoms supervene and the patient seems to be unable to recuperate, even though the disease has apparently spent its force. *Hepar sulphur* is often needed to promote expectoration in the paralytic stage, and it assists in clearing up the lungs in retarded cases. *Calcarea* and *Periura* may be called for in the closing stage of pneumonia in young children, the latter especially when the expectoration is exceedingly putrid. *Arsenicum* will often be found a useful remedy in the low stage of typhoid-pneumonia and in the general debility that follows upon the course of ordinary croupous pneumonia. *Arsenicum iodatum* may be needed to assist in clearing up a case that threatens to develop phthisis pulmonalis, and in the stage of red hepatization this remedy and *Calcarea iodata* will often be found useful in promoting resolution. *Silicia* will be called for in cases in whom recovery is retarded, with prolonged suppuration and recurring pulmonary abscesses. It is also needed when empyema follows upon pneumonia or pleurisy, the patient threatening to develop phthisis florida.

CONVALESCENCE.—Extra precautions will be necessary during the stage of convalescence following pneumonia, to avoid recurrence of the disease or the development of pulmonary phthisis in subjects so predisposed. The proper constitutional remedies should be continued over a considerable period of time, and the patient be given the benefit of a thoroughly nutritious diet and the best possible climatic influences. As has been stated, persons who have once had pneumonia are likely to have it again; hence the importance of a complete cure of the first case. Most convalescents from pneumonia do well on pure cod liver oil, petroleum emulsion and other carbonifying agents; and where it is possible should also be given the benefit of a change to a warm, dry climate for a period of two or three months, at least, following upon severe manifestations of the disease.

CHAPTER LXXIX.

EMPHYEMA.

General Considerations—Symptoms and Course—Diagnosis—Surgical and Medical Treatment.

General Considerations.—Empyema is invariably due to infections, whether from the lungs by pneumonia, from the septic infective process, septic tuberculosis or other constitutional condition, or from infection through injury, as injury to the ribs from blows or other causes. Empyema is suppurative pleurisy. It is much more common in children than in adults, and is seen more often in boys than in girls. It is a common condition with tuberculous diseases of the lungs and pleura, and is occasionally seen in association with rheumatism and diseases of the kidneys. The fluid that is effused in pleurisy always contains coagulable elements. At first it is serous or sero-fibrinous but later becomes milky, and if air be admitted quickly becomes purulent. This also occurs without the admission of air, at least from without, as the result of surgical puncture. If air be admitted the change of pus is rapid, otherwise it may be slow. If the pleurisy be due to acute dysentery or other infective disease the secretion may be pus-like from the start. If connected with dysentery the amebæ coli are the cause of the empyema. Other bacilli that are seen in the fluid are the streptococci, staphylococci, pneumococci, diplococci and the bacilli of tuberculosis.

Symptoms and Course.—The symptoms and course of empyema do not differ materially from those of simple acute pleurisy, if dependent upon inflammatory pleuritis as a cause, unless the actual formation of pus occurs, when the change is indicated by increase of fever and recrudescence of all the symptoms of pleurisy, excepting, perhaps, the acute pain. If it occurs independently of acute pleuritis it shows itself by fever, which assumes the remittent type with aggravations at night, loss of appetite, restlessness, sleeplessness, and pain in the region of the pleura, the case generally assuming more or less of the hectic type, with emaciation and manifest decline on health. It is so often seen in tuberculous children that it is not infrequently mistaken for acute tuberculosis. With the fever, pain, and gradual emaciation there is an irritative cough, and sooner or later alternating chilliness, feverishness, and debilitating sweats occur. If the secretion of the fluid in the pleural sac, shown by considerable bulging of the affected side, occurs the heart is displaced, the lung is oppressed, the stomach encroaches upon the spleen, pushing upward, if the left side is affected, and downward

if the right side is involved, the general picture being one of decline and distress.

Empyema is nothing more nor less than an abscess of the pleural sac, that is the conditions are those that obtain in internal abscess. There may not be considerable distinction of tissue, and yet the pus of empyema is sufficiently erosive to cut its way through the tissue to the surface. It perforates the pleura and peritoneal tissues, and insinuates itself between the fibres of the intercostal muscles, appearing as a subcutaneous effusion that is not infrequently mistaken for abscess of the chest wall. If the perforation be direct from within outward pus may be discharged in considerable quantity at a single point in the abscess; but as its track is more likely to be oblique and irregular, only a portion of the fluid is discharged at a time, owing to the valve-like action of the different layers of the tissue, the larger portion of the fluid being detained, especially when there is oozing or intermittent discharges of pus upon pressure, coughing, deep inspiration and other muscular efforts.

More often empyemic abscesses are emptied through the lung. The fluid erodes its way through the pulmonary pleura and is taken up by the lung, to be thrown off through the bronchial tubes. If the opening be direct into the bronchus the abscess may be emptied by forcible ejection of its contents in a coughing spell, much as large tubercular vomicae are emptied, such emptyings occurring with a certain degree of periodicity, and the cavity refilling. The pus ejected in this way is generally exceedingly offensive, so much so as to be altogether intolerable. A fistulous track forms from the pleura to the bronchus, as though efforts to carry the most possible infection to the lung by putrid pus—directly connecting the tracheal tubes and the abscess cavity—were to be thus permanently established. These cases are accounted the most favorable, as occasional collapse of the pleural sac occurs with absorption and recovery, the patient being left with a bronchial cough that drags out over a long period of time. If the fluid fail to empty spontaneously through the lung, or if it be not evacuated externally, the pus may burrow downward, penetrating the diaphragm, across the lung by the spleen, behind the peritoneum, opening into the lumbar region or in the groin or thigh. Cases are recorded as having broken into the peritoneum or pericardium, and as having caused, also, fistulae of the peritoneum.

Diagnosis.—The physical signs of empyema are not very different from those of other abscesses of the pleura. Besides dullness, bulging and the audible signs abetted by the presence of fluid, there may be considerable edema of the chest wall. It has also been suggested that when the effusion is purulent the local fremitus produced by whistling is not transmitted to the hand as in serous effusion. The local area of empyema may be more per-

manent than in simple effusion, and if the abscess tends to open downward the external tissue assumes an inflammatory appearance. This opening occurs usually in the fifth intercostal space in front, or just below the angle of the scapula if it open posteriorly.

If empyema appears quickly the chest symptoms are more pronounced, the temperature is higher from the start and the fever becomes intermittent and remittent. The heart's action is more rapid and the pulse more feeble. Hectic symptoms, as chilliness, loss of appetite and general debility, are more pronounced than in simple effusion. Examination of the urine for peptonuria is often of value in diagnosing a purulent effusion. It should be borne in mind, however, that peptonuria occurs in phthisis with suppuration of the apical cavities, and is also seen in the primary process. The chemical differentiation will turn upon peptones and bile acids. If the yellow sediment deposited upon the addition to cold urine of saturated solution of iodide of potassium, followed by three or four drops of Millar's reagent, eventually acid in its reaction, fails to respond to the test for bile acids this failure is due to the presence of peptone.

Notwithstanding the difference in the physical signs between purulent effusion and serous effusion it is not in most cases possible to tell the character of fluid that is present in the pleural sac, except by inspection, aspiration, by its discharge through the lung or by external perforation.

Surgical Treatment.—The treatment of empyema will be both surgical and medical. If the pleurisy be acute and the effusion clearly pronounced immediate relief may be demanded in order to avoid eventual compression of the lung. In cases demanding prompt surgical relief the pain is intense, the dyspnea pronounced, the pulse exceedingly weak, and the patient threatened with immediate collapse. Death may result from compression of the blood vessels, from pulmonary thrombosis, and from heart failure. This character of case may be mistaken by the careless observer for pleurodynia, but the dullness upon percussion, the hectic symptoms that are present, the fremitus and friction sounds will diagnose it with sufficient clearness. Where the symptoms are as acute as those just described, and especially where collapse is imminent, paracentesis is demanded. The surface of the chest should be rendered aseptic by being quickly scrubbed with soap and water, washed with antiseptic solution, and, finally, in ether. The aspirator needle, which has been sterilized in boiling water, to which a pinch of soda has been added, should be plunged between the ribs, in the fifth, sixth or seventh intercostal space, near the upper portion of the rib below the selected space, in order to avoid wounding an artery or nerve lying in the upper part. If purulent effusion is suspected or known to be present a coarse

needle should be used; whereas, if the operator is certain that the fluid is of serum the finest needle of the set may be employed. If immediate action is required and an aspirator is not at hand relief may be obtained by the use of the ordinary hypodermic needle and trochar, or even by a bistoury incision. The objection to the latter is that incision is apt to result in the emptying of all the fluid, which excites irregular action of the heart, pulse and respiration, and induces severe cough. No matter what form of tapping be employed the fluid should never be all withdrawn at once, lest collapse ensue. During the operation the physician should closely observe the facial expression, the heart's action, and the respiration, for signs of syncope, physical depression, or collapse. During the operation death has occurred from heart failure, thrombosis, and sudden obstruction of the air cells, when a careless operator has been in charge. The fluid should always be withdrawn slowly in order that the lung may gradually expand as it is withdrawn, and that the chest wall that has been bulged outward may undergo gradual retraction. While the larger the accumulation the greater the necessity for immediate operation and sensible withdrawal of the fluid, yet it is in extreme cases that the danger is greater and that precautions are necessary. It may be wise to compress the chest walls with the hand as the fluid is aspirated, if it has been greatly distended.

Aspiration need not be practiced if the patient is doing well, even if effusion be considerable. Subsequent absorption is the rule with children, and even in adults a considerable quantity of pleuritic effusion eventually occurs. Children, if otherwise enjoying a reasonable degree of health, recover from paracentesis, even, resorption of pus taking place in time. While paracentesis is demanded in the severe cases and pronounced cases with general decline, unless one or the other of these conditions be present it may be well to rely wholly upon constitutional treatment and the gradual upbuilding of the patient's health. In adult life it is better to resort to surgical measures promptly.

In performing paracentesis the skin should be pinched up between the fingers, transfixed and punctured by the needle or incised by a bistoury from below upward. Anesthesia is not necessary if cocaine be employed externally and by subcutaneous injection. If incision be resorted to the knife should be plunged into the pleural sac higher than the opening through the skin, it being the intention to allow the latter to act as a valve, closing over the internal opening. If temporary or permanent patency of opening be required a perforated tube may be inserted, or a pledget of sterilized gauze instead, thus securing drainage by capillary attraction. In exceedingly putrid cases it is well to wash out the cavity with solution of permanganate of potassium, boric acid, Thiersch's solution or other antiseptic. As a rule,

however, irrigation is not now considered essential. Abscess cavities of long history will require drainage, irrigation and the injection of agents that induce adhesive inflammation for their effectual cure. In one case resulting from traumatism I found it necessary to resect a portion of the seventh rib and insert a silver drainage tube, allowing it to remain *in situ* for several months, before repeated irrigation and stimulating injections, together with constitutional treatment and supportive diet, closed the cavity.

Medication.—Remedies that will be required are *Arsenicum iodatum*, *Bryonia*, *Silica*, *Hepar sulphur*, *Kali murialeum*, *Calcarea*, *Lycopodium* and *Psorinum*.

Arsenicum iodatum is especially called for in purulent pleurisy with great emaciation and prostration, worse on expiration; sharp, suppressed cough; great weariness and debility, the general *Arsenicum* picture. It is especially applicable in chronic effusion in strumous children.

Bryonia has more pain than *Arsenicum*, aggravated upon coughing. Child is compelled to support its chest during coughing spells because of the pain. The fever of *Bryonia* is intense and persistent, not remittent nor intermittent as with *Arsenicum*. While better suited to the simple effusion of acute pleurisy and not often called for in purulent effusion yet with its characteristic pains and persistent fever, with hard, racking cough present, *Bryonia* will be especially applicable.

Hepar sulphur is suited to long-lasting pleurisy with plastic exudations and accumulation of foul pus ejected from the lung or subsequently drained off slowly through the chest wall. The hectic fever and emaciation are pronounced, with repeated attacks of chilliness, fever and sweats. Prolonged suppuration, no matter what its course or location, calls for *Hepar*.

Sulphur and *Psorinum* are especially adaptable to chronic pleuritic effusion in tuberculous children, with shortness of breath, oppression of the chest, debility and manifest evidences of general ill health. *Psorinum* is eminently called for when the pus is exceedingly putrid, the breath is offensive, the stools are offensive, the whole child is offensive.

Kali carbonicum is indicated in the chronic tuberculous patient with stitching pains, worse in the latter half of the night, not like those of *Bryonia*, the pleuritic inflammation being secondary to lung disease, together with violent pleuritic stitches in the lung and chest, worse after three o'clock in the morning, and upon efforts at deep inspiration. There is palpitation of the heart, dry cough and pain as though the pleura and lung were adherent.

Silica, *Calcarea carbonica* and *Calcarea sulphurica* are especially indicated in empyema seen in association with phthisis florida. *Calcarea fluorica* will be called for in combined cases of empyema and tuberculosis in young girls with rapid consumption.

quick emaciation, and recurring empyema. *Calcareo sulphurica* is more especially adapted to pleuritic effusion secondary to the eruptive fever in young children of the *Calcareo* type, large heads, open fontanelles, nightly sweats about the head and neck, retarded dentition, and the combined constitutional picture of *Sulphur* and *Carbonica*.

Silicis will be required in indolent suppuration of the pleura lasting over a long period of time, with thin, sanious pus, slow emaciation, firm fistulous tracts from the abscess to the bronchial tube or externally, with a general *Silicis* state of the patient. Metastatic abscess in different parts of the system, furuncles, onychias and styes occurring in tuberculous children, and those suffering with chronic purulent discharges, require *Silicis*.

In addition to these remedies, *Mercurius*, *Carbo vegetabilis*, *Kali iodatum*, *Arsenicum album*, *Calcareo iodata*, *Kali phosphoricum* and *Calcareo phosphorica* may be required in special cases.

The diet and general constitutional management of empyema is that belonging to tuberculosis in children from other chronic debilities. Climatic change is absolutely necessary in persistent cases. Ingrafted as it is upon tuberculosis in the majority of cases empyema will result fatally not more from debility, for which it is responsible, than from the lighting up of a general tuberculous condition which remains uncured.

CHAPTER LXXX.

ASTHMA.

General Considerations—Etiology and Pathology—Clinical Types—Symptoms and Course—Spasms—Diagnosis—Prognosis—Treatment.

General Considerations.—Asthma is a neurosis manifesting itself by paroxysmal dyspnea, caused by or associated with a peculiar catarrh of the bronchi, with spasmodic contraction of the finer bronchial tubes. It is characterized by distressed breathing, wheezing respiration, contraction of the chest, signs of heaviness and compression of the upper part of the chest, especially, and is usually attended by more or less cough, and perhaps some frothy expectoration. The term "asthmatic breathing" is applied to all difficulties of respiration that simulate true asthma.

For convenience of description asthma is spoken of as occurring in two varieties, idiopathic and symptomatic, or primary asthma and secondary asthma. The latter types attend most often upon organic diseases of the heart or lungs, and may be seen in

association with goitre, aneurisma, rickets, diseases of the spinal cord, and from accumulation in the bronchial tubes—and even in the bronchioles—of organic substances or calcareous concretions. It is also seen in association with renal, gastric and malarial diseases, and is common to certain rheumatic and gouty states. It appears, too, as a result of nervous complications, as from reflex derangements, cardiac irritations, sexual neuroses, intestinal dyspepsia and worms, and, as has been ascertained more recently, from certain rectal abnormalities. Within recent years it is being understood that rectal irritations are among the most common causes of the nervous type of asthma, even though no symptoms present themselves as directly associated with the rectum.

For the wide range of causes that have been given as responsible for attacks of asthma it will be seen that in proportion to the entire number of cases observed but a limited number are left to show themselves as instances of true idiopathic asthma. This number is so small, in fact, that it is hardly worth while to longer consider the disease in this relation. It may and does occur without our being able to discover a reflex cause for the attack, as though it were dependent, as hysteria and chorea seem to be, upon an unstable condition of the nerve cells. The typical variety has been classed by Whittier and other authors as deserving of place in nosology by the side of epilepsy, insanity and migraine, with which it is often seen in alternation. In attacks of asthma in subjects of clear genealogy this disease comes under the classification of typical asthma; and yet it is not certain that these subjects are free from every cause that tends to operate reflexly upon the vagus.

Asthma is seen at all ages of life, from earliest infancy up to old age. One-fourth of all cases are observed in children under ten years of age. It occurs more frequently in boys than in girls, and is seen in the better walks of life more often than among the poor. It is observed more frequently among subjects of peculiar idiosyncracies and those of exalted nervous sensibilities. Some children and some adults are thrown into severe paroxysms of asthma by inhaling the odor of a particular flower, or by the presence of an obnoxious individual, by fits of anger, by fright, grief or other mental emotion. Certain articles of food that set up indigestion in asthmatic subjects will invariably bring on attacks of asthma. Special barometrical changes or atmospheric conditions also act as exciting causes, and if the patient be of hysterical disposition as well as of asthmatic habit the slightest occurrence that disturbs the equanimity will throw the susceptible individual into a violent attack of asthma.

Etiology and Pathology.—Heredity is not credited with an important part in the production of asthma. While it seems to run through families yet it is the senescent habit rather than the

asthmatic habit that partakes of the character of heredity, and the asthma is rather an accompaniment upon the neurotic state than in itself an heirloom. It is said by numerous authors to be due to a spasm of the bronchial muscles, it having been shown that there is muscular tissue in the walls of the finer bronchi, and that irritation of the lungs and the pneumo-gastric nerve produces contraction of these tubes. The two clauses of this theory are antagonistic. The muscular fibres of the finer bronchi could not remain in spasmodic contraction unless the nerves supplying them were in a state of irritation; hence, whatever causes this irritation is really the cause of the asthma, if indeed the "muscular theory" be allowed to stand. Another theory is that the difficult breathing is due to tumefaction of the bronchial membrane, from turgescence of its blood-vessels, caused by the action of the vaso-motor nerves. Here again it will be seen that the nervous system is primarily at fault. A third theory is that asthma is dependent upon catarrh of the bronchioles, and Leyden holds that certain located octahedral crystals, which have been found in the sputum of asthma, produce the condition by irritating the terminal nerve fibres in the bronchial mucous membranes. And here again it will be seen that the nervous system is at fault, or responsible at least for the spasmodic dyspnea and all the physical manifestations of asthma.

In fact, almost every clinical observation goes to show that asthma as ordinarily seen is due to irritation of the sympathetic nervous system somewhere.

Special factors that are known to have relation to individual attacks of asthma, besides those already enumerated under the head of general considerations, are to be mentioned, as locality, hours of occurrence, general condition of the health, habits of life, surroundings and psychological influences. Some patients have attacks of asthma by the seashore and nowhere else; others in the country and never in the city; others again are free from asthma in rural districts and invariably suffer from it in the city; some subjects never have asthma except in church, in the theatre, or other crowded room. In some asthma is excited by fog and dampness, while in others it comes on in exceedingly hot weather. With many it occurs only at night. Some patients who suffer from asthma at points of moderate elevation are free from it at considerable altitudes, while with others the reverse is true.

Clinical Types.—Catarrhal asthma is seen in association with acute or chronic catarrhal disorders, the mucous membrane of the throat and bronchial tubes being in an altered state, in severe cases badly inflamed. Suffusion of the eyes and nasal secretion are symptoms that are seen in this type of asthma, and more or less engorgement of the chest, oppression, coughing and asthmatic breathing make up the catarrhal picture. These cases usually result from the taking of cold, or sudden suppression of the per-

operation. After the initial irritative stage is passed there will be considerable secretion of mucus in the tubes, with imperfect breathing and expectoration of a catarrhal nature. In children catarrhal asthma may be engrafted upon the latent catarrhal condition, such children taking cold readily, asthma, even to extreme dyspnea, occurring as the acute inflammation subsides. Here the asthma is seen in nightly exacerbations, following upon each succeeding cold, in subjects who are narrow-chested and who have chronic nasal catarrh.

Hay asthma is a type of asthmatic breathing that occurs in association with acute bronchial irritation and catarrh. It is a summer catarrhal affection that passes under the name of rose-cold or hay-fever. It is seen most commonly in subjects of neurotic type who are especially susceptible to odors, whether pleasant or foul, who are possessed of unusual sensitiveness of temperament and are otherwise emotional. This type of asthma occurs in the summer season or fall of the year, and it has been thought to be due to the pollen of certain flowers, as it occurs most commonly during the season when the worm-wood blooms, as in August and September. Even recent authors ascribe it wholly to pollen (Whittier); but it seems hardly likely that it can be due to this cause, since perhaps but one of a number of neurotic persons in a given family or community will be affected, and since certain subjects find quick relief in special localities or climates in which other sufferers have this trouble. It is beginning to be believed that it is largely a neurosis, and perhaps due to some special irritability of the olfactory nerve. It is not often seen in children, though occasionally witnessed in youths. It comes on with coughing, sneezing, severe coryza, difficulty of breathing, with suffusion of the membranes of the eyes and nose. In specially severe cases sneezing is almost a constant symptom, and the nostrils become inflamed and swollen, being excoriated, exceedingly sensitive, and discharging copiously a thin watery blood or acid secretion. Organic breathing is a distressing symptom in many cases of hay fever, hence the use of the term hay-asthma in this connection.

The term Millar's asthma is frequently applied to spasmodic croup or laryngismus stridulous, and by some authors is still mentioned as a type of asthma occurring in children. It is a neurosis of the larynx and not of the bronchial tubes, and while frequently confounded with infantile asthma is still very different. It is unfortunate that this name has been adopted in this connection, since it tends to confuse and convey the thought that laryngismus stridulous is an asthmatic affection, whereas, strictly speaking, asthma relates to spasms of the minute bronchi. Millar's disease occurs in connection with heart troubles, and is also seen as a result of acute congestion of the laryngeal membrane, coming on suddenly from taking cold, regression of the perspiration and other causes.

Symptoms and Course.—Asthma usually sets in suddenly, and generally at night, occurring, as a rule, without the least premonition, although it may be attended in children by a stage of cold, cough, and ordinary catarrhal symptoms prior to the development of asthmatic breathing. In some cases a premonitory heaviness of the chest is experienced for a few hours or a day or two before difficult breathing sets in. In children, however, its onset is almost always as sudden as spasmodic croup, the child awakening from a sound sleep struggling for breath, with a sense of weight and constriction about the chest that seems as though it would suffocate him. From recumbent posture he is compelled to sit up in bed in order to get his breath, and if disposed to be of nervous temperament throws himself about violently, grasping at the bed and clothing, at his throat and chest, or holding on to his nurse or parent in terror through fear of impending suffocation. There is usually no cough, nor much, if any, expectoration. The breathing is wheezing, rasping, whistling in character, is usually rendered somewhat easier by bending forward with the shoulders elevated, the patient grasping at his knees with head thrown backward. The face wears a distressed and anxious look, and because of the interference with aëration becomes somewhat cyanotic and dusky. The *alae nasi* dilate to the fullest limit, the vessels and muscles of the neck stand out prominently, the chest heaves and the child brings into play all the accessory muscles in efforts to get his breath. The eyes are prominent and staring, and the patient is compelled to lie or sit with his mouth partly open in order to get sufficient breath for his needs. He is usually disinclined to talk, even to answer question in monosyllables, his whole time and attention being directed toward breathing. The expansion of the thorax is limited by the condition of the chest muscles and the inability of the lungs to expand. The pulse is small, rapid, and thready. The temperature is usually not elevated, and may even be subnormal. The surface is generally cold and clammy, and sometimes cyanosis is so pronounced that a fatal issue is feared. Inspiration is short, jerky, slightly accelerated, and attended by great physical exertion. Expiration is labored and prolonged. The descent of the thorax protrudes the abdomen, and the constriction of the abdominal muscles, in their effort to assist in their respiration, causes the abdomen to be hard and resistant. This results in flatulence in many cases, while accumulation of gas in the stomach adds to the distress. When thrown off in quantity momentary relief obtains. Auscultation reveals sonorous and sibilant rales, and, later, mucous or submucous rales in abundance, these drowning all other sounds. The distension of the lungs causes higher tympanitis than normal upon percussion, when if the tension of the alveoli is pronounced the characteristic handbox tone is revealed.

The asthmatic attack may last an hour, a half dozen hours, or two or three days, depending upon its severity and the chronicity of the disease. In recent cases after the lapse of a few hours the patient begins to breathe somewhat easier, soon falls asleep from exhaustion, awakening worn out from his severe labors but otherwise as well as before. As the paroxysm subsides there is more or less of cough and expectoration, the sputum consisting of rounded tenacious masses. In some cases there is frothy sputum that is more or lessropy. It is never mixed with blood, nor is there danger of bronchitis or pneumonia developing as a sequence of asthma, unless, in order to get his breath, the patient has been exposed to draughts of air, resulting in the taking of cold during the asthmatic attack. The temperature continues normal during the primary visitation. Repeated attacks occurring irregularly or in successive occurrence over a period of a week or two are seen. If the weather is unusually damp often in the history of a case bronchitis sets in in association with asthma in debilitated children, those in whom more or less congestion of the mucous membranes arises as the result of the asthma.

Sputum.—The sputum ejected by the asthmatic patient is seen to contain certain angular elongated octahedral crystals.

These are found in grayish masses in the sputum. They may be colorless or of slightly bluish tint and are usually surrounded by masses of epithelium and imbedded in a spiral structure. The crystals are insoluble in cold water and alcohol; they will dissolve in alkali, mineral waters, warm water, and acetic acid water. They are identical with crystals discerned in the semen, in the blood, and in cases of leukemia. They have been found also in the fibrinous flakes of bronchitis, in the secretion of bronchial catarrh, in association with nasal polyp, and in the stools of wormy children. The spirals spoken of exist in the grayish masses found in



FIG. 71. Asthma spirals.



FIG. 72. Asthma Crystals.

the sputum, and together with the crystals are seen most abundantly at the beginning of a bad attack. They can be seen with the naked eye, but are brought out more clearly with a glass, and, according to Vieoedti, correspond to the product of catarrh of the smaller bronchial tubes. It is not believed that these crystals and spirilla are pathognomonic of asthma, since they exist in association with other diseases. Yet many authors are disposed to contend that it is the irritative influence of the crystals that excites the attack.

Diagnosis.—Asthmatic breathing is associated with many conditions of the lungs and of other systemic states, yet is not difficult of diagnosis in children as a rule. The suddenness of the paroxysm, the difficulty of breathing, the severe anxiety, the distress and the absence of the croupy cry of laryngismus stridulous serve to differentiate it from most other conditions attended by severe dyspnea. Other disorders that cause obstruction of the air passages are apparent in the throat, as retro-pharyngeal abscesses, diphtheria, spasmodic croup and edema of the glottis, while bronchitis, pneumonia, emphysema and certain disorders of the heart, kidneys and digestive organs also have obstructed breathing. In asthma the dyspnea is seen chiefly in association with expiration, while in most other obstructions to breathing the difficulty is in inspiration. Wheezing in the chest is characteristic of asthma more than any other disease, and the absence of fever will serve to separate its diagnosis from that of bronchitis and pneumonia. Diphtheria is comparatively easy to diagnose from asthma, except in the laryngeal type of diphtheria; while even here the gradual oncoming of dyspnea serves to differentiate it from asthma, with its sudden onset and violence of paroxysm. Laryngismus stridulous, or croup, is more nearly allied to asthma, for it too is comparatively free from fever and is not likely to be associated with catarrhal conditions; but examination of the chest will show in the earlier stages an absence of the wheezing, whistling, asthmatic respiration, and in the latter stages the coarse, croupy cough and changed inspiration will direct attention to the throat instead of the small bronchi.

Asthma and emphysema may exist in the same patient and cause confusion, and it must be remembered that severe attacks of asthma are likely to result in emphysema. If the latter condition be established the dyspnea is more or less continuous and not spasmodic as in uncomplicated asthma, and is aggravated by exercise, excitement and emotions, these aggravations occurring when the patient is conscious, or during the wakeful hours, while asthma comes on more often when the patient is asleep. The dyspnea of heart-disease is very much like that of asthma, but the presence of heart symptoms in patients with asthma who are subjects of heart disease will serve to clear the diagnosis. The valvular murmur complications, dilatation and other ailments of heart involvement, as irregularities in rhythm, intermittent pulse, dropsical conditions, and edema, will clearly associate the asthmatic breathing as a symptom of heart ailment.

Asthma goes also with bronchitis, pneumonia, pleuritic affections, phthisis, edema of the lungs, spasm of the diaphragm, embolism of the pulmonary artery and with certain forms of kidney ailments; but in all these conditions it is clearly symptomatic and the careful observer is not likely to be misled. The danger of con-

fusion is far less in children than in adults, though, as with adults, it increases with advancing years, so that discriminating care will have to be exercised as youth is approached.

Prognosis.—Asthma is rarely fatal. It is astonishing how severe may be the labors of the asthmatic patient to get his breath, how prolonged his attacks may be and how frequently recurring without material injury to the system. An attack of asthma is unfortunate in that it implies a reasonable likelihood of subsequent attacks. "Once asthmatic always asthmatic," is an old saying, which, however, is by no means always true. In advanced years the humid form of asthma may be fatal, and if the patient be already severely debilitated by cardiac lesion or organic kidney diseases a violent attack of asthma may prove to be the straw that breaks the camel's back. In child-life and young subjects it is not recognized as among the fatal diseases, except in extremely exceptional cases. Children of phthisical constitutions who are the subjects of chronic bronchitis or unrecovered pneumonia may be placed in greater jeopardy by the development of asthma as an associated condition; but an attack of asthma occurring independently of other diseases is rarely fatal, and recovery from it is usually prompt. The chiefest danger lies in its recurrence, and in frequent repetitions of sharp attacks, the lungs becoming emphysematous and the patient gradually phthisical in habit.

Treatment.—It is desirable always to look for the cause of the asthmatic attack in instituting treatment. Many cases are associated with dyspeptic diseases, and if in any wise depending upon an overloaded condition of the stomach it will be best that the *prima via* be cleared of offending masses if prompt relief is to be hoped for. If dependent upon rectal irritations, whether the condition be that of worms, hemorrhoids, or other physical irritations, these must be removed or relief will not obtain. The researches of official surgery have cleared up the causes of many cases of asthma, and show the rectum reflex upon the pneumogastric nerve to be so pronounced that this pouch should not be overlooked in recurring cases of asthma. If the paroxysm seem to be associated with any organic ailment of the system treatment will naturally be directed toward the relief of the condition producing the dyspnea, while remedies are directed to violent paroxysms of asthmatic breathing, as a symptomatic condition. If due to unwholesome surroundings, the presence of offending odors, whether pleasant or unpleasant, or to other physical conditions that can be removed, efforts should be directed toward prophylaxis, it being folly to attempt to cure asthma in the continued presence of the operating cause. In a general way the asthmatic patient should be kept warm and comfortable, his sleeping apartments should be light and airy, he should be protected against draughts of air while sleeping, but not so heavily covered with

bed clothing as to be kept perspiring and made restless by its weight. Asthmatic children should eat light suppers of easily digested food, their bowels should be kept moderately free by proper attention to food and habits, but not by purgation. The use of perfumery in child-life should be interdicted, as it often serves to excite asthmatic attacks, or to render the child's nervous system more liable to physical impressions.

Medication will be directed in the line of remedies to relieve the spasm. Inhalations, vaporizations, and relaxants generally are not usually beneficial, yet an occasional violent attack can be aborted in individual instances by a whiff of chloroform or ether; though it must be borne in mind that complete anesthesia in these conditions is dangerous, owing to the imperfect oxygenation of the blood.

Among the best adjuvants in the treatment of severe attacks of asthma that I have ever used is the combination of oxygen and nitrous-oxide gas. Nitrous-oxide gas is a safe anti-spasmodic and anesthetic in lung disease, the chief objection obtaining to its use lying alone in the fact that the patient presents a considerable degree of cyanosis that serves to excite alarm. This is overcome by the use of oxygen with nitrous-oxide. For many years it was my practice to use the combined gases in chronic throat and lung diseases, and all my asthmatic patients learned the value of the preparation, adults even applying for treatment for violent spasms of asthma in the middle of the night. With children a few whiffs of the combined gases will give quick relief from severe spasms of asthma, as also of spasmodic croup. Unfortunately it is not always to be had at night, especially in practice in the country; yet as now put up in cylinders by reliable houses, ready for immediate use, it is much more easy of obtainment.

Remedies that will be found most useful in asthmatic attacks of children when the spasm is already on are *Aconite*, *Belladonna*, *Sambucus*, *Stannum*, *Nuxvomica*, and perhaps *Chamomilla*.

Aconite will naturally be thought of if the attack is superinduced by exposure to cold, and if it is ushered in by acute catarrhal symptoms, with cold in the head, coryza, suffusion of the eyes, fever, restlessness, and other *Aconite* symptoms. If the case is seen early this remedy will often abort spasmodic asthma in children.

Belladonna.—While not in many respects a chest remedy yet *Belladonna* is among the most useful of the anti-spasmodics, and in children is applicable to violent acute spasms of asthmatic breathing attended by constriction of the chest and a sense of constriction of the throat, as if the child would suffocate. The spasm comes on suddenly and is severe, cyanosis appears early and is pronounced. The special feature that calls for *Belladonna* is the spasmodicity of the attack.

Sambucus will be found a very helpful remedy in asthma attended by considerable suffocation, when the breathing is anxious,

loud, wheezing or crowing in character. There is much heaviness and oppression of the chest with dry suffocative cough, worse about midnight. Nightly attacks, with relief and moderate expectoration of tough mucus through the day.

Nuxvomica will be called for in asthma arising in excitable dispositions and in peevish, irritable children, whose attacks are aggravated by anger and vehemence. *Nux* is an anti-spasmodic of value in all spasmodic conditions, and while more especially applicable to spasms of the cerebro-spinal system is yet frequently useful in spasmodic states of the sympathetic. Asthma reflected from the stomach or from diseases of constipation and hemorrhoids is not infrequently amenable to this remedy. The *Nux* paroxysm comes on about three or four o'clock in the morning. The cough is short, sharp and tight, and the paroxysms are aggravated by exposure to cool air.

Sanguinaria is particularly applicable to asthma estyrum, worse from odors; breathing is short, rapid, and continued. Shocks caused from lifting; constant inclination to take deep inspiration which but increases the constriction. Cough is hoarse, hard and dry and the breathing exceedingly difficult.

Artemisia is applicable to asthma in weak, delicate children, coming on periodically. Asthma threatens in the afternoon and develops actively after midnight. Danger of suffocation so severe that the patient springs out of bed and tries to get to the door or window in order to breathe. Surface cold and clammy, face hippocratic and anxious. Wheezing, whistling, rattling breathing, with but little expectoration. *Artemisia* suits alike asthma of aged and infirm people and children who are weak and debilitated.

Ipecacuanha is applicable to asthma with moist cough and rattling of mucus in the chest. Patient pants for breath; threatened suffocation, nightly suffocative attacks, going into relaxation and nausea with ejection of mucus and phlegm, in connection with vomiting.

Chamomilla.—This remedy will be thought of in connection with the temperament of the child rather than for the disease. Indicated when the child is irritable, cross, peevish, wants to be carried, obtaining relief from its asthmatic attacks when lying on its chest across the nurse's shoulder, with the asthma increased by its nervousness, and associated with dry, tickling cough. *Chamomilla* will often overcome the asthmatic attack by allaying the fidgetiness of the child.

Dalmanera is especially adapted to humid asthma occurring from exercise, or due to raw winds and to rains.

Cyprus has spasmodic asthma, constriction of the throat and chest, face and neck pale and convulsions threatening. Asthma from mental emotions.

Capricorn is adapted to catarrhal asthma with sibilant rales, better when coughing up mucus.

Cactus will be thought of in cardiac asthma with constriction of the chest and stitches in the region of the heart; sensation as if cold about the heart.

Digitalis is also to be thought of in association with cardiac asthma. Sudden cessation of the respiration, great anxiety and restlessness. Respiratory murmur feeble, heart-shock and slow pulse.

Arum triphyllum is particularly adapted to hay fever, sneezing, pain and contraction about the throat, with profuse coryza in the afternoon.

Amba grisea is suited to asthma in children of "scrofulous" habit. Spasmodic cough commencing in the low passages of the throat; oppressed breathing, eructations of wind from the stomach.

Aper melifica is applicable to asthma from the suppression of menses. Paroxysm comes on quickly and is unusually severe. Great dyspnea, as if every breath would be the last.

Grindelia robusta suits mucous asthma with accumulation of mucus in the smaller tubes. Nervous asthma. Patient afraid to go to sleep because of the aggravation on waking. (*Lachesis*.)

Kali bichromicum is suited to asthma depending upon bronchiectosis, the tubes filling up with tenacious mucus. Cough is worse about two or three in the morning (*Nux*), and the breathing is hoarse and whistling in character, with croupy cough and hoarseness of the voice.

Lycopodium will be found useful in asthma resultant upon measles or whooping cough, and in association with attacks of indigestion; extensive flatulence and distension of the abdomen, in scrawny, unhealthy children of dyspeptic habit.

Nephthalin is often exceedingly useful in hay asthma. The spasms of the bronchi are severe, with rattling of mucus in the chest but no expectoration. The eyes and nose are suffused, the chief difficulty lying in the oppression of the breath.

Sabadilla and *Conium* will also be found useful in hay fever.

Stannum is an excellent remedy for asthma with oppression of the chest, associated with cough with expectoration of viscid mucus. The asthma of woemy children and young chlorotic girls will often be promptly relieved by *Stannum*, as will also asthma depending upon rectal irritation.

Stramon is an excellent remedy in the asthma of children with oppression of the breath and great rattling of mucus in the chest. The cough comes on in suffocative paroxysms, the child gasping violently for breath.

As will be seen, the list of remedies suited to asthmatic conditions is extensive, and from the nature of the case differentiation

is difficult. Besides those named *Cocculus* is applicable to hysterical asthma. *Citronellis sativa* to humid asthma. *Borago arborescens* to asthma of scrofulous children. *Arsenicum iodatum* to asthma occurring in phthisical and scorbutic subjects. *Hydrocyanic acid* to severe paroxysms of nervous asthma, with intense constriction of the chest. *Kali muriaticum* to cardiac asthma. *Kali phosphoricum* and *Crataegus* to nervous types of asthma. *Magnesia phosphorica* to spasmodic, nervous asthma, with dry, spasmodic, tickling cough, coming on in paroxysms. *Natrum sulphuricum* to asthma engrafted on syctic subjects. *Silicio* to asthma engrafted on syctic subjects. *Spongia* to asthma in association with goitre. *Thuja* to syctic asthma. Besides these, *Sticta*, *Rumex*, *Phosphorus*, *Porrius*, *Mephitis*, *Kali carbonicum*, *Drosera*, *China*, *Asclepias*, *Sulphur*, *Calcearia*, and other remedies, will be called for, either as symptomatic or basic medicines, in association with the asthma of consumption.

The treatment of asthma by medication will depend very largely upon its excitive relationship, though of necessity it will have to be systemic. The general constitutional condition of the patient affords the real key to the prescription that will result in a cure, but asthmatic attacks are so often dependent upon apparently trivial causes, or are seen as a result of so many different circumstances, that it will be necessary in prescribing for an individual attack to cover not only the constitutional peculiarities of the patient but the direct operating cause of the paroxysm, its nature, individual symptoms, hours of aggravation, ameliorations, and, in fact, the entire symptomatology of the patient, if the best results are to be hoped for.

It is not enough in child-life to relieve the paroxysm. The disorder should be uprooted, root and branch, and this can be best accomplished by the exhibition of the proper constitutional remedy, in occasional doses of moderate or high attenuation in the interim between attacks by the suited remedy, whether it be *Sulphur*, *Calcearia*, *Thuja*, *Lycopodium*, *Porrius*, *Silicio*, *Tuberculin*, *Arsenicum*, or other deep acting agent.

As with phthisis pulmonalis and bronchitis so also with asthma, the patient should have the benefit of the best climatic influences obtainable. As a rule, these will be found in non-agricultural sections of country of moderate altitude and temperate climate. Asthma in children is often a synonym for a lack of proper lung development, this meaning eventual destruction by consumption. Children in whom asthma recurs in spite of well directed treatment are proper subjects for climatic change.

The application of official surgery to some asthmatic subjects will be found among the best means of relief and cure. Without undertaking to explain why the condition exists so often in asthmatic subjects, and without entering into detail as to why light

sphincter, rectal papillæ, hemorrhoidal irritations or other rectal abnormalities induce asthma it is an accepted fact that these conditions are among common causes of asthmatic attacks in adults, and doubtless they are frequent causes in children, especially in youths. Here the proper application of orificial practices will be found to be of value. It is sufficient in many severe cases of asthma to produce anal dilatation of the sphincter by means of the bivalve speculum, or the oiled finger in very young subjects, to overcome severe paroxysms.

In confirmed asthmatic subjects a thorough course of orificial surgery may be necessary to a cure. In no inveterate case should the rectum, vagina and prepuce be overlooked.

Another frequent cause of asthma, even in young subjects, is deviation from the normal of the nasal septum, the presence of polypi, enlarged turbinates and other abnormalities or defects in the nasal organs. These cases naturally require the attention of a specialist.

SECTION VIII.

DISEASES OF THE URINARY SYSTEM.

CHAPTER LXXXI.

NEPHRITIS.

General Considerations—Symptoms and Course—Diagnosis—Prognosis—Treatment.

General Considerations.—Nephritis is seen in children in two forms, acute nephritis and chronic nephritis. Acute tubal nephritis has been described by various authors under the name of acute Bright's disease, acute catarrhal nephritis, acute crescentic nephritis, acute desquamative nephritis, and acute parenchymatous nephritis. It is almost always seen in children as the result of acute exanthemata, especially scarlet fever, though it is also seen in connection with diphtheria and erysipelas, and from burns, scalds and injuries affecting the nervous centres. When observed in connection with scarlet fever it may occur within the first week of the disease, but is more commonly seen as it progresses, being often met with as post-scarlatinal dropsy; that is, the more acute symptoms of scarlet fever will have subsided when there will be a quick lighting up of acute, typical inflammation of the kidneys, and almost before the physician is aware of it he will be confronted by an organic affection of the kidneys which is more serious than the initial disease. In adult life this form of nephritis may result from sudden suppression of perspiration, the taking of an acute cold, developing about as quickly and from the same general causes as are seen to excite pneumonia in persons apparently enjoying perfect health; but these causes are not recognized as operating in child-life, and the disease under consideration, though manifesting in the acute form of kidney disease, is almost invariably a secondary process.

Symptoms and Course.—If nephritis comes on acutely during the early days of scarlet fever it is ushered in by acute symptoms. There will be a more or less sharply defined chill or shivering sensation, lasting from a few minutes to half an hour, and quickly followed by fever, the temperature rising to one last-

died and three to one hundred and four degrees. The pulse is tense, short, sharp and rapid in its beating, the tongue is coated, the appetite lost and the bowels generally constipated. The child usually suffers headache and vertigo and dull pain in the lumbar region. It may be excessively nervous or its sensibilities may be rather benumbed. Sometimes the former condition precedes the latter, which finally amounts to a more or less profound coma. The urine is diminished in quantity from the first, or it may be that the initial symptom is that of frequent desire to urinate, the quantity being rather increased from twelve to twenty-four hours, when it becomes much less than normal and is increased in density and color, varying from a bright pink to a deep brown. Chemical examination reveals the presence of albumin, which sometimes amounts to one-fourth, or even one-half, the volume. Microscopic inspection reveals hyaline, epithelial and blood casts, and there may also be renal and epithelial granules, urates and amorphous matter. During the first days blood casts will be seen in excess, but as the disease progresses the hyaline and epithelial casts become more abundant and fatty and granular casts are seen later, unless recovery be unusually prompt and complete.

Edema early shows itself first in the cellular tissues beneath the eyes, in the cheeks, and the cellular tissues of the cervical region, or perhaps it may be first seen on the dorsa of the hands or feet. If the child is in the recumbent posture fluid accumulates on the posterior surfaces of the thighs and under the knees. Abdominal dropsy shows itself in the course of a few days and the suppression of urine is pronounced. Effusion shows itself in the lungs and pleural and pericardial cavities, and edema of the glottis is pronounced, resulting in asphyxia in severe cases. Fortunately this condition is rare. The heart's action becomes at first rapid and forceful, but in later stages it becomes slow and weak from uremic irritation. In severe cases nervous phenomena are soon ushered in and a fatal lesion follows general uremic poisoning. Acute nephritis in children may pursue a milder course than this, and it is not uncommon to witness as a sequel to scarlet fever a moderate degree of typical nephritis from which recovery is easy and complete. Instead of being ushered in by an acute chill, quickly followed by an increase of temperature and other sharply defined evidences of acute inflammatory action, the case comes on more gradually, with shortness of breath, more or less vomiting, and irregularity of heart action, with obscuration of the first sound and accentuation of the second, unusual pallor of the skin, edema of the eye-lids, hands and feet, gradual decrease in the quantity of urine excreted, a puffy, waxy appearance of the face, the onset of the case being so gradual as not to be observed until this puffiness of the face and hands and the difficulty of breathing attract attention. It will then be remembered that the kidneys

have not been acting as freely as they should, or perhaps that irritation had existed for a day or two, followed by decrease in quantity, abnormality in color and consistency of the urine. The child complains more or less of a dull headache. Even in this type of the disease there is generally more disturbance of the temperature, more or less of irritation and a sense of anxiety and discomfort, attacks of shortness of breath and abnormal action of the heart due to abnormality of blood pressure and uremic irritation. Examination of the urine will reveal albumin, a low specific gravity, and distressing decrease in quantity during twenty-four hours. As the case progresses pleural effusion, edema of the lungs and general dropsy ensue.

Acute nephritis may be seen in the course of diphtheria, measles, pneumonia, typhoid, and other fevers, being occasionally the cause of death in septic diarrhea of infants. Nursing children may suffer what appears to be an idiopathic nephritis. Donkin is of the opinion that typical nephritis, including nephritis from chill, is much more common in children than in adults.

Diagnosis.—The diagnosis of acute tubal nephritis will depend upon the presence of a considerable quantity of albumin in the urine, together with blood casts, followed by epithelial and hyaline casts, and perhaps later by granular casts, together with low specific gravity of the urine, decrease in the quantity excreted and general acuteness of the case. The diagnosis will also be aided by the existence of acute exanthematous diseases upon which the kidney disorder depends. Cases coming on independently in young subjects without acute irritative fever or acute sepsis to account for their presence are difficult of differentiation from chronic tubular nephritis, but ought not be confounded with any other disease.

Prognosis.—Tubular nephritis is not as severely dangerous as suppurative nephritis and various other types of degeneration of the kidney, but it is among the grave disorders and is not infrequently fatal. In its more violent symptoms it may run a rapid course, terminating favorably within two weeks. In other cases it drags along over a protracted period of time, the patient usually succumbing to exhaustion or uremic convulsions or uremic coma, or requiring long and proper treatment and management, but recovering even when the disease has passed on into the second stage with hyaline and granular casts. But when renal epithelium and fatty casts are thrown off, and suppuration ensues with general dropsy and severe uremic symptoms, the dangers are increased and recovery is far less likely to occur under even the best treatment and care.

Treatment.—Acute tubal nephritis coming on idiopathically, or in the early stage of scarlet fever or other acute zymosis, requires acute treatment; that is, the administration of remedies

that are adapted to inflammatory processes of acute variety, together with the exhibition of local measures and adjuvant treatments found necessary to insure the recovery of the patient.

The hygienic treatment of this type of nephritis requires that the patient be kept in the recumbent posture, thoroughly warm, his skin active and his body and mind as free as possible from exercise or excitement. Efforts must be made to increase the activity of the skin, thus to promote the elimination of salts and afford the kidneys as much relief as possible from the performance of their function. The body must be sponged daily and sometimes two or three times a day with warm water to which has been added bicarbonate of soda. If the subject is dry and feverish, as is sometimes the case, it is necessary to wrap the patient in a wet sheet, subsequently incasing him in a blanket; the pack to be repeated every one, two, three or four hours as necessary, the object being to keep the skin moist and thus to aid diaphoresis. For this purpose it may be desirable to give the patient plenty of water to drink, which should never be ice cold, but administered warm, tepid, or cool as the patient prefers. Copious hot enemata also assist in diaphoresis. The room should be kept warm, not below 70°, 80° being preferable, though the air should not be close and stuffy. If it be not desirable to apply the wet pack nor to excite too great activity of the skin the child should be incased from head to foot in flannel nightwear in order to avoid chilling the skin and to keep the temperature equable.

Remedies that will be required for the treatment of nephritis in the first stages are *Aconite*, *Belladonna*, *Ferrum phosphoricum*, *Veratrum album*, and perhaps *Apis mellifica* and *Mercurius*. If it be certainly apparent that the disease was brought on by cold or sudden suppression of perspiration, or by sitting or lying on the damp ground, and thus causing congestion of the kidneys, the case being ushered in by a sharply defined chill quickly followed by thirst, restlessness, headache, and sudden suppression of the urine, *Aconite* will be called for. This remedy is also beneficial in sudden development of kidney disease during the course of scarlet fever, but the symptoms calling for it are of the acute variety that belong to *Aconite* everywhere.

Ferrum phosphoricum and *Veratrum viride* are occasionally useful in the initial stage of nephritis, *Veratrum viride* more especially in association with pneumonia, and *Ferrum phosphoricum* more especially when with the congestion of the kidneys there are evidences of hemorrhage in the urine.

Belladonna will be needed when the kidney symptoms develop promptly along with the smooth variety of scarlet fever, when there are stitching pains in the kidneys extending to the bladder, the urine being hot and scalding, blood-red, attended by evidences of

congestion of the kidneys, severe headache, threatened spasms and other pronounced *Belladonna* symptoms.

Aster wulffian is especially useful when edema comes on quickly and is attended by dull, aching pains in both kidneys. The feet are swollen, the face is puffed, the urine is greatly decreased in quantity, dark and burning. It may be almost wholly suppressed, even that which is excreted being retained in the bladder. The respiration is suppressed and the heart's action is irregular. The urine passes in drops and is attended by considerable strangury. Though hot, dry and restless the patient is thirstless. *Aster* is more useful in pale puffiness of nephritis with post-scarlatinal dropsy. The face is waxen in appearance and there is puffiness of the throat and edema of the uvula.

Mercurius cyanatus is an excellent remedy in the first and second stages of post-scarlatinal nephritis. The urine is scanty, dark, turbid, loaded with albumin and perhaps bloody; it may be pale brown with grayish sediments. *Mercurius* has specific pain in the tubes of the kidneys and in its pathogenesis shows epithelial, hyaline and granular casts, with blood cells and large quantities of albumin. It is among the best of the curative remedies for post-scarlatinal nephritis.

Bryonia is an excellent remedy for nephritis ensuing upon sudden suppression of the eruption that occurs in association with pneumonia or typhoid fever of the *Bryonia* type of case. The urine may be clear or slightly clouded, yet is greatly diminished in quantity and loaded with albumin. The characteristic condition that calls for *Bryonia* is the development upon sudden recession of the rash of kidney symptoms, as though the disease process were spending itself upon the kidneys instead of upon the skin.

Benzoic acid is adapted to renal pains that are sharp and severe, radiating through the back and even into the chest. There are dull pains in the region of the kidneys and rheumatic pains about the joints. The urine is very dark and strongly ammoniacal. The odor is exceedingly penetrating, the child's urine smelling as strong as that of the laboring adult. *Benzoic acid* is more especially adapted to nephritis acting in association with rheumatic states and with synovitis following upon scarlet fever.

Khus khus is adaptable to nephritis occurring from recession of scarlet fever eruption not assuming the typhoid type. There are tearing pains in the rectal region and general edematousness. The nephritic symptoms develop acutely upon exposure to wet, or to raw, damp winds during convalescence from scarlet fever or other severe disease.

Cantharis is more particularly adapted to cystitis than nephritis, but is often beneficial in the latter disease when the fever is intensely hot, the skin dry and pungent to the hand, and micturition painful, only a few drops passing at a time, the urine being scald-

ing and bloody. Connected with these symptoms are other uræmic catarrhal symptoms. The *Cantharis* case is intensely acute, the patient exceedingly restless, and the case attended by severe pain in the region of the kidneys and genitals.

Terebinthina is very much like *Cantharis* in its effect upon the kidneys. The urine is scanty, dark, and occasionally bloody, loaded with albumin, and there is general edema and a sense of burning in the region of the kidneys. *Terebinthina* is well adapted to bloody urine occurring in the first stage of nephritis, with general renal congestion.

Besides the remedies mentioned, *Arnica*, *Berberis*, *Argentum nitricum*, *Colchicum*, *Chamæmilla*, *Cannabis*, *Helleborus*, and *Phosphorus* may be required. For other indications for remedies in Nephritis consult chapter on Chronic Nephritis.

CHAPTER LXXXII.

CHRONIC NEPHRITIS.

General Considerations—Symptoms and Course—Diagnosis—Prognosis—Treatment—Diet—Medication.

General Considerations.—While acute tubular nephritis is often seen in association with the acute exanthemata and septic processes of child-life, yet the subacute type of the disease is most often seen as a sequel to the infectious diseases of children. Chronic tubular nephritis has been classified as chronic diffuse nephritis, chronic catarrhal nephritis, chronic Bright's disease, chronic parenchymatous nephritis, and chronic interstitial nephritis. It is in a large majority of cases simply an extension or continuance of the acute process of nephritis, following upon the acute manifestations of this disease that depend upon scarlet fever and other zymoses for their origin, and that have not been wholly cured. Diphtheria is a more common cause of the remote development of Bright's disease than scarlet fever, the nephritic complications occurring earlier in scarlet fever and more directly in association with its earlier symptoms. Diabetes mellitus is almost always followed by chronic tubular nephritis and is occasionally preceded by its development in the course of protracted suppuration, as a result of bone disease. I have met with two cases that were resultant upon injury to the humerus, one being an ununited fracture in a rachitic child, the other a case of gunshot wound involving the head of the humerus. Chronic tubular nephritis also results upon the excessive use of domestic and old school medicines that have specific effect upon the uriniferous

tubules. Quinine, the coal tar derivatives and proprietary drugs are responsible for a great many cases of chronic nephritis. Children who are continually dosed with nostrums, tonics, spring blood-medicines, and the like, are frequently the subjects of slowly developing nephritis. The poisonous effect of these medicines upon the tubules of the kidneys is in part the result of mechanical irritation from over-elimination of the urea through the uriniferous tubules.

Symptoms and Course.—Chronic tubular nephritis is essentially a chronic ailment. In some cases it drags its slow length over a period of years, while in others a few weeks, or at most a few months, is sufficient to insure a fatal result. The more pronounced the symptoms the more rapid the course. It comes on insidiously and is not generally recognized until debility, oppression of the chest, and palpitation of the heart are seen. The pulse is small, feeble, rapid and irregular, and acceleration reveals anemic heart murmur. The digestion is always impaired, appetite capricious or absent, tongue coated, and bowels generally torpid, though in rare cases diarrhea may be present. The face becomes earthy or waxy in appearance, and while it lacks the sallow line of jaundice yet the careless observer may sometimes mistake it for that condition, especially if there be torpor of the bowels and enlargement and tenderness of the liver at the same time, as is often the case when scarlet fever or malarial infection is the cause of the torpor. The face becomes beefy and the dorsa of the hands and feet show affection. The ankles swell, and as the disease progresses the lower limbs become generally edematous and anasarca occurs. With increased inception of the dropsical symptoms the heart's action is more labored and irregular. The urine grows scanty, darker and more torpid. Its specific gravity is from ten hundred and twenty to ten hundred and twenty-five, and the albuminometer shows from two to three grammes per litre of albumin. Blood casts, renal epithelia and granular matter are seen in confirmed cases, while hyaline and epithelial casts are present in abundance in chronic Bright's disease. The urea is decreased and the chlorides, sulphates and phosphates are diminished.

As the case progresses the urine becomes paler, of lower specific gravity, even as low as ten hundred and ten, and the sediment diminishes in quantity, but the albumin remains stationary. The hyaline casts increase in number, are large and of unusual shape. The epithelial casts present a granular appearance, and the blood casts disappear as the epithelia is shed. As the third stage sets in the urine becomes more scanty and clouded than before, the albumin increases, and the casts change to a fatty variety. They are sharp, large, and irregular, and contain minute granules of fat. As partial suppression of the urine occurs uremic symptoms begin to develop, as nervous jactitations, twitch-

ings, headache, and finally uremic convulsions; or the case may take on the character of the comatose variety, the patient gradually sinking off into coma without special nervous manifestations or convulsions.

While the changes that carry the disease through these three different stages have been going on the dropsy has been gradually increasing until in severe cases it becomes enormous. The limbs swell to twice their natural size, the skin becoming stretched, ecchymosed and glossy. The puffiness is changed to the doughy edema of severe dropsy, and the pittings made upon pressure remain more or less permanent. General dropsy of the abdomen occurs and often takes place within the pleura and pericardium. Pulmonary edema ensues, rendering breathing exceedingly difficult, and because of the extra labor that is thrown upon the heart as it undertakes to force the blood through the dropsical tissues its beatings are forcible, irregular and tiring to the patient. In individual cases in which uremic symptoms are absent and in which coma doesn't terminate the case the patient is simply worn out by the extra labor his heart has to perform, exhaustion terminating the case.

Diagnosis.—This form of kidney disease will have to be very carefully differentiated from chronic interstitial inflammation, which, however, is very rare in children, and usually easily recognized. It is slower and more insidious in its development, the quantity of urine being greatly increased while the amount of albumin contained therein is much smaller than in tubular nephritis. The specific gravity is also lower, and the heart symptoms are more pronounced. Dropsy is never present in interstitial nephritis until the very last stages, while in the tubular forms it is present early. Lethemia is a constant accompaniment of chronic interstitial nephritis, and never seen in the tubal variety. The tubal form will have to be differentiated from amyloid degeneration. In the milder type of kidney disease the urine is greatly increased in quantity, and the amount of albumin is also large. There are no leucocytes nor epithelial cells present, and structureless hyaline cells may be seen. This type of kidney disease is nearly always associated with syphilis, tuberculosis, or some chronic affection attended by suppuration. It attends comminuted fractures and other injuries of the long bones. Amyloid degeneration and tubal nephritis are sometimes present at the same time, rendering differential diagnosis impossible.

Prognosis.—While chronic tubal nephritis is among the fatal diseases of child-life yet if taken in hand before the morbid processes are too far advanced and if given the benefit of proper treatment, diet and hygiene it is a disease from which its subjects may recover. During the inflammatory stage recovery is readily possible, and even later on, before actual degeneration has

set in, it is curable in children. In the second stage the chances are not so good, while when the process passes on to atrophic wasting recovery is hardly to be hoped for. Favorable symptoms as the case progresses are decrease in the quantity of albumin, disappearance of casts, relief of the dropsical symptoms, and improvement in the appetite and action of the heart and circulatory vessels. The pathological anatomy of chronic tubal, interstitial and amyloid diseases of the kidneys is too elaborate for presentation in this connection. Special works on diseases of the kidney should be consulted.

Treatment.—The treatment of chronic Bright's disease will be largely dietetic and hygienic. When the case comes on as an acute ailment, or when it is clearly apparent that the inflammatory processes are still going on, even if they have been so insidious as to be well advanced before attracting attention, it is necessary that the organs should be rested, that the patient be kept as quiet as possible, and free from all unnecessary exposures. The clothing should be thoroughly warm and protective. The skin must be kept guarded from draughts of air, and it is desirable that unconscious perspiration be kept up continuously, in order that the kidneys may be relieved as much as possible from the performance of their function. Flannel should be worn constantly, even the night wrappers being composed of woollen goods. Occasional sponging of the body with tepid or warm water should be practiced, special precaution being taken that no chilling of the skin shall occur during the bath. The feet must be kept perfectly warm, and under no circumstances should suppression of the perspiration, or sudden chilling of any portion of the body, be allowed. If a resident of a cool climate the subject must be as carefully guarded as the tenderest hot-house plant during the winter season, and for this reason it is very much better that subjects of chronic kidney disorder be given the benefit of warm, dry climates.

As Whittaker puts it, a change of residence to a warm dry climate is worth all the drugs in the materia medica. The best climatic sections for children suffering from chronic tubal nephritis are Southwest Texas, Mexico, in the neighborhood of Monterey, Riverside, California, and other naturally warm and dry parts of California, Southern Georgia, Western Florida. The evaporating climate and pure air of Southwest Texas make that section especially valuable in the treatment of chronic Bright's disease.

Diet.—The diet should be plain, simple, and nutritious. Pure water, alkaline mineral waters and skimmed milk may be used ad libitum. The skimmed milk diet has been practiced extensively in recent years with more or less of success. Patients who tire of it may have pure milk as a substitute, and koumiss will also be found beneficial. The latter should be taken as light diet, and all albuminoid vegetables should be avoided. Highly-

seasoned foods are objectionable, nor should the invalid be allowed to gormandize on even the simplest article of food. The simpler and more nutritious the food the better, and it should be administered at regular intervals according to the digestive abilities of the patient. Articles to be avoided are cooked oysters, fried fish, smoked and salted meats, ham, tongue, corned beef, sausages, pork, all hashes, stews, gravies, eggs, peas, beans, hot breads, pie, cake, ice cream, beer, ale, coffee and ice water. (Mitchell.)

MEDICATION.—Chronic Bright's disease following upon scarlet fever, and most cases occurring in child-life depending upon the acute exanthemata, will require a limited range of remedies. Individual characteristic symptoms may occasionally suggest the use of almost any remedy in the materia medica, but the general picture of chronic Bright's disease is so nearly uniform in different subjects that the list from which the similitum will have to be selected is not a long one. *Apis*, *Digitalis*, *Terebinthina*, *Mercurius corrosivus*, *Phosphorus*, *Arsenicum*, *Coxallaria*, *Lachesis*, *Helleborus* and *Apocynum* cover occasional cases. *Calcarea sulphurica*, *Sulphur*, *Lycopodium*, *Glonium*, *Ipecacuanha*, and, for the nervous system, *Ignatia*, *Nux vomica*, *Stramonium*, *Aconitum*, *Capsicum* and *Zincum* will occasionally be thought of and found beneficial.

Apis.—This is one of the leading remedies for the albuminuria that follows upon scarlet fever. The face and limbs are bloated, the skin is waxy, the eyelids and lower part of the face are puffed, the breathing is labored, there is a sense of heaviness and pain in the lumbar region, and while the secretion of urine is scanty the desire to urinate is frequent. The edema that calls for *Apis* is general. The urine is heavily charged with albumin, and also contains blood corpuscles. It is for the general dropsy and suppression of the urine that *Apis* is best adapted. Characteristic symptoms of *Apis* are the passivity of the patient and the thirstlessness.

Mercurius corrosivus.—The destructive action of corrosive sublimate upon the kidneys is well known. The kidneys are enlarged, dark red, and the cortex and pyramids are so changed as to be hardly distinguishable. The texture of the kidneys is looser than normal, and has been known to contain small abscesses. Among other symptoms calling for this preparation of mercury are lumbar pains in the renal region, scanty urine with frequent desire, or total suppression of urine. The urine is black, very dark and bloody, highly albuminous, and contains fatty, epithelial and granular cells. There are puffiness of the face and feet, great dyspnea and excessive strangury; occasionally the bowels are disturbed and there will be diarrhea with straining and colic. The appearance of the urine and the distress upon urinating are leading indications for the *Corrosivum*.

Digitalis is a very valuable remedy in the heart disturbances that go with chronic Bright's disease. Its primary effect upon the kidneys is that of a diuretic; its secondary effect is that of an anuretic. Hence it is easy to see that it is often appropriate to those disturbances of the kidney shown by irritation and by increased frequency of urination in the first stage of the disease, followed by almost complete suppression in the second stage. It is, however, the heart symptoms rather than the kidney indications that point to *Digitalis*. The heart's action is irregular and abnormal. Its beats are rapid and feeble, or exceedingly slow, with strong feeble action. In the slight dilatation yet weak action of the heart common to Bright's disease *Digitalis* is among the best of remedies. When suppression of the urine is almost complete and the nervous symptoms are threatening the low attenuations and crude preparations of the drug will be found useful in tiding over the crisis, prompting a freer flow of the urine and thus avoiding uræmic convulsions.

Phosphorus.—This remedy has a specific action upon the kidneys. In cases of phosphorus poisoning they are found softened, yellowish-brown in color, with hypertrophied and congested cortical substances, the corpora and malpighii injected, and the tubules whitish, due to granulo-fatty degeneration. The urine has been known to contain epithelial cells, pus, albumin, exudation casts and blood cells, and in cases that are quickly fatal in phosphorus poisoning a general hyperemia of the kidneys and its symptomatology often make *Phosphorus* the simillimum. The skin is pale, even to yellowish in color, with puffiness of the eyelids and face. The urine is dark brownish, scanty, and contains albumin. There may also be whitish or yellowish sediment. When pneumonic complications occur in the course of Bright's disease, as cough, oppression of the chest, edema and dyspnea, it will be found especially indicated. Pulmonary engorgement with local hæmorrhagic expectorations are not infrequently seen in the course of Bright's disease, and here *Phosphorus* will often be the simillimum.

Terebinthina.—Turpentine is among the frequently indicated remedies for Bright's disease at some stage of the process. The urine contains albumin, cylindrical casts, oxalate of lime, and inflammation cells. There is irritation, congestion, and inflammation of the kidneys, which extends also along the course of the ureters. The urine is scanty and bloody, and has a peculiar violet odor. Later it may become increased in quantity, slimy and lighter in color. The general symptoms show shock, with diminished pulse, depressed circulation and excessive coldness. Or exactly the opposite condition may be present in kidney congestion, the skin being hot and dry, the pulse rapid and weak, the patient restless, with headache, thirst, and frequent desire to urinate, the discharge being scanty, burning and bloody.

Arsenicum.—This remedy is homoeopathic to the general state of Bright's disease, including the weak heart action, the scanty urine, the general puffiness, edema, debility, the anorexia and otherwise disturbed digestion, the dyspnea, pulmonary edema and restless anguish seen in typical cases. The effect of *Arsenicum* upon the kidneys is to produce a counterpart of the conditions seen in chronic Bright's disease, the pallor, thirst, anasarca and exhaustion, making it thus a remedy of first importance.

Caultharis.—It is much like *Terebinthina* in kidney disease, more especially useful in the stage of kidney congestion, with hot, burning urine, and pains in the region of the kidneys. Sharp, cutting pains in the urethra and bladder before urination, with passage of a small quantity of scalding urine at a time. *Caultharis* is especially useful for kidney symptoms from burns and scalds, and also for acute suppression attendant upon sudden recession of the eruption of scarlet fever.

Benzoic acid.—This remedy will be called for in chronic Bright's disease when the characteristic strong-smelling urine is present, with pains radiating from the region of the chest.

Berberis.—It will be indicated when there is intense pain in the back; pain radiating from the kidneys in every direction. Patient complains of back-ache, stiffness and lameness in the lower part of the back.

Helleborus.—This is especially beneficial in dropsy that attends nephritic inflammation in young children. Congestion of the kidneys with extensive effusion of serum in the abdominal cavity. Urine scanty and dark. *Helleborus* is especially applicable to dropsical conditions attendant upon scarlet fever and tubercular meningitis, effusion occurring within the brain, presenting the characteristic *Helleborus* symptoms.

Convallaria.—Very much like *Digitalis* in its effect upon the heart and kidneys. Extremely rapid, irregular action of the heart with general anasarca attendant upon mitral disease, with dilatation of the heart, will sometimes be relieved by this remedy. The muscles and valves of the heart are both affected. The urine is scanty, or increased in quantity. The circulation is impaired and the heart's action generally irregular. In cases in which *Digitalis* does not give satisfaction *Convallaria* may be found to be the remedy.

Lachesis.—Like unto *Arsenicum* in its general picture. Heart debility, rapid and feeble pulse, oppression and weight on the heart and lungs, apprehensive anxiety, threatened convulsions and pain upon awaking from sleep call for *Lachesis*. An occasional dose of high potency will often quiet the violent functional disturbances of the heart that are seen in the course of chronic Bright's disease.

It is not often necessary to prescribe for the uremic twitchings and convulsions of chronic Bright's disease, since when these are seen the case is usually fatal and beyond the hope of medication. Nevertheless, remedies are occasionally applicable and beneficial, and it does not necessarily follow in every instance that because uremia has occurred death must ensue. *Uranium nitricum*, *Hydrocyanic acid*, *Cuprum*, *Gelsemium*, *Belladonna*, *Zincum*, *Apis*, *Crotalus*, *Stramonium* and other remedies may be called for. If spasms occur in connection with sudden suppression of the scarlet fever rash, *Belladonna*, *Bryonia*, *Veratrum viride*, *Rhus tox.*, *Cuprum* or *Gelsemium* may be necessary to redevelop the eruption, prompt relief of the convulsions ensuing thereupon. If the patient is comatose or partially so, convulsions coming on during coma, *Agaricus*, *Opium*, *Bryonia*, *Helleborus* or *Belladonna* may be required. If with the convulsions there is paralysis, *Gelsemium*, *Picric acid*, *Strychnia*, *Cuprum* and *Zincum* will be the initial reliances. If the convulsions are ushered in with acute aggravations during the course of a case of chronic Bright's disease *Apis*, *Camphora*, *Terebinthina*, *Gelsemium*, *Aconite* or *Helleborus* may be demanded.

Apocynum is especially useful in the dropsy that occurs in the course of kidney disease, more especially when the organic state is not one of complete disorganization. The patient becomes enormously dropsical, the abdomen is filled with water, pleural effusion occurs, the extremities are greatly swollen and the tissues are everywhere edematous. Occasional outbursts of diarrhea which give relief are witnessed, or the dropsical state becomes more general. Here *Apocynum* in low attenuation, or the tincture, will be found an excellent remedy, and if strictly homeopathic with the case will act curatively. I have never found it to be of more than temporary use, but it is rare that it will not be found beneficial at some stage in the course of chronic Bright's disease. It is not always well adapted to the stomach, exciting nausea and vomiting. If full doses are necessary they may be administered by warm water rectal enemata. *Digitalis* and *Apocynum* have been often administered in my practice for the relief of the dropsical symptoms that threaten destruction to life.

Calcaria sulphurica.—This remedy has served me well in the dropsy of children following upon scarlet fever, the urine being heavily loaded with albumin. In *Calcaria* subjects with general dropsy and with albuminoid, hyaline, and epithelial casts in the urine, it is a remedy of value. The patient is weakly, debilitated and waxy, dentition has been slow and its osseous system is not well developed. Naturally pot-bellied, the abdomen is enormously distended with gases, and the face and feet are severely edematous. The child is sluggish and lymphatic, with unhealthy skin and hair.

Kali sulphuricum may also be found useful in albuminous urine following upon scarlet fever, while *Kali muriaticum* is more applicable to nephritis with the characteristic œdema, and *Kali phosphoricum* is indicated for functional disturbances of the nerve centres with intermittent action of the heart and pulmonary œdema.

CHAPTER LXXXIII.

CYSTITIS.

General Considerations—Symptoms and Course—Treatment.

General Considerations.—Acute cystitis, though it is not common among children, may be seen in them from any of the causes that induce it in adults. It may be excited by the taking of cold, or it may follow upon scarlet fever, diphtheria or measles. It is occasionally caused by the too free use of drugs, especially domestic remedies that are given for worms, as turpentine and other vermifuges. It may also be an effect of burns or scalds, or may depend upon extension of inflammation from other organs. It is not uncommonly seen in connection with the lithemic state that goes with rheumatism, and is often witnessed as secondary to the application of vesicants, as fly-blisters, belladonna-plaster, stramonium-plaster, and like applications. It should be remembered also, that very young children are occasionally subjects of stone in the bladder, and inflammation of the lining membrane of this viscus may result from that cause. Children who are sensually inclined occasionally succeed in introducing foreign bodies into the bladder, which set up inflammation of the membrane. A noted instance of this character was reported some years ago in one of the journals in which a piece of slate pencil had been inserted into the bladder by a young girl. There occurred in my early practice a case of severe cystitis the result of calculus, in a child a year-and-a-half old, the child finally passing into the urethra a stone that completely occupied the caliber of that canal and that was half an inch in length. The meatus had to be enlarged to nearly twice its normal size before the calculus could be extracted.

Children are also rendered subject to cystitis by errors in diet. Strawberries, currants, and other acid fruits occasionally set up urticaria and symptoms of acute cystitis, these generally subsiding, however, in the course of a few hours. Inflammation of the urethra and neck of the bladder with symptoms of cystitis may follow upon extension of inflammation from the vagina and vulva, as a result of the presence in the vagina of seat worms. Suppressed measles more commonly excites cystitis than does scarlet fever or

diphtheria, the latter diseases more especially affecting the kidneys. An excess of soda in food is occasionally the cause of cystic inflammation.

Cystitis also develops from extension of kidney inflammation downward, in children such ailment following upon renal manifestations from the acute exanthemata. In older subjects it may be caused by extension of urethral disease of the bladder, and is also seen in connection with cancer, tuberculosis, septicæmia and other constitutional states; but it will not often be due to these causes in children. Paralysis of the bladder, resultant upon disease of the brain or spinal cord, is an occasional cause of inflammation of the viscus, through autolytic decomposition of the urine.

Symptoms and Course.—The initial symptom of cystitis is pain. The child dreads to urinate because of the pain that the act excites, yet as the inflammation progresses the desire to urinate is almost constant, strangury is pronounced and the patient strains severely. The quantity passed is small, the urine is hot and scalding, and either intensely acid or highly alkaline in reaction. The pain differs in intensity from simple distress and a moderate degree of downward pressure upon urinating to the greatest anguish. In young subjects it will even be so severe as to cause convulsions. Pain radiates from the bladder along the course of the urethra, involving the testicles and rectum, and being often felt at greatest intensity in the glans penis. The straining is persistent, so severe as to induce exhaustion. The quantity of urine that is passed at one time is but a drachm or two, or perhaps but a few drops, and as the tenesmus becomes more severe it is mixed with blood, until finally almost clear blood may be passed.

Unusually severe cases that resist ordinary methods of treatment, and that are attended by severe pain and considerable hemorrhage, justify examination of the bladder for calculus. While not often seen in children yet they are by no means exempt from stone, and even in very young subjects vesical calculus may be the cause of the cystitis.

If due to simple causes, as errors in diet, taking cold, the application of vesicants, or the excessive use of the ordinary drugs of domestic practice, cystitis is apt to be a transitory ailment which responds promptly to treatment. If due to the presence of stone it will continue more or less intermittently as long as the cause continues to operate. If due to profound systemic states, as tuberculosis or septicæmia, or if dependent upon severe diseases of the kidneys, the inflammation is likely to continue with the course of the primary disease.

Treatment.—Simple acute cystitis will require but little treatment. The patient should be put to bed and kept as quiet

as possible for a few days. The diet should be light and nourishing, and the food should consist largely of liquids. Mucilaginous drinks are desirable, and plenty of pure water may be given. If necessary hot sitz baths may be applied, or cloths wrung from hot water and laid over the bladder and genitals will be found beneficial. The remedies that will be found especially applicable are *Aconite*, *Ferrum phosphoricum*, *Belladonna*, *Apis*, *Cantharis* and *Terebinthina*.

Aconite will be required when the case comes on acutely from taking cold. The symptoms are ushered in by a chill or chilly sensations, and are quickly followed by fever, sweat, frequent desire to urinate, the urine being hot and scalding. The urging is intense, the mental distress pronounced. *Aconite* will not be needed more than a few hours, and as the acuteness of the symptoms subsides it may be succeeded by *Ferrum phosphoricum*, if it fails to altogether clear up the case.

Ferrum phosphoricum should be thought of in cases lacking the intensity of *Aconite* and early showing blood in the urine. The more the hemorrhage the greater the need of *Ferrum phosphoricum*. The pain is not so acute as in *Aconite*, nor is the fever so pronounced; but pain and fever are present, and bleeding occurs early.

Apis is called for when there is great irritation at the neck of the bladder with repeated urination of a small quantity of scalding and burning urine. There is intense burning and stinging in the urethra. Urination is difficult in *Apis* children; they try to urinate but cannot. *Apis* will be required when cystitis results upon the application of fly-blisters or other vesicants, and when it results from the sting of insects.

Belladonna has severe straining with passage of small quantities of hot, fiery urine. The bladder is exceedingly sensitive to the touch, and the pain so severe as to excite convulsions. The child screams violently, and is quite beside itself with pain when urinating.

Cantharis has violent tenesmus, intense pain in the back, painful discharge of a few drops of bloody urine, and almost constant desire to urinate. *Belladonna* has more of a bearing down and outward pressing than *Cantharis*, the latter exciting contractions of the bladder with spasm of its neck. Constant urging to urinate.

Mercurius corrosivus is an excellent remedy in cystitis with severe straining that depends upon chronic albuminuria.

Lycopodium is applicable to chronic cases with the characteristic red sand in the urine, due to uric acid. Urging to urinate, but sluggishness in voiding the urine.

Pulsatilla will occasionally be called for in the cystitis of children. *Scopa* is also applicable in special cases where the urine

is thick, slimy, and very offensive. *Terebinthina* has severe straining like *Cantharis*, with violent burning and cutting pains in the bladder. *Sarcoparilla*, *Lithium carbonicum*, *Dalcamara*, *Hyoscyamus*, *Cauticum* and *Berberis* will also be called for in special cases.

In unusually severe cases the bladder may be irrigated with hot calendulated or plain water, thorough washing being demanded when such irrigation is practiced. A weak solution of boric acid water has been used with success, but plain warm water or calendulated water will be found preferable.

CHAPTER LXXXIV.

ENURESIS.

General Considerations—Etiology—Symptoms—Treatment—Diet and Hygiene—Circumcision.

General Considerations.—Incontinence of urine is a very common ailment in childhood, and one that causes a great deal of annoyance. Some children have so confirmed a habit of wetting the bed that it seems almost impossible to overcome it during the early years of child-life. It belongs to children in all walks of life, and while the habit of incontinence is not necessarily confined to the nightly hours yet it is when the child is asleep and its system relaxed that the accident is most likely to occur. It also happens during the day when the child neglects to relieve its bladder promptly because of the excitement attendant upon play, or because it is not always convenient to obtain relief upon call. In nervous children incontinence is a frequent result of nervous excitement, no matter what its cause.

This ailment is seen among children of robust constitution as well as in those of delicate physique, but is perhaps more common with the latter. Children of nervous temperament are more subject to it than those of sluggish disposition, and yet it is not infrequently seen in unimpressible, lymphatic subjects.

Etiology.—Enuresis is a neurosis of the sphincter muscle of the bladder, which fails to develop sufficient strength for its purposes in enuretic subjects as they pass from infancy to childhood. It occurs most often when the subject is asleep, when the sphincter muscle is not under control of the will. It is seen oftenest in the years between three and ten, but in special cases drags along until the age of puberty, or later. Chorea is an exciting cause of enuresis, and it is also seen in the rheumatic state. Wormy chil-

children are apt to have reflex irritations of the bladder that result in wetting the bed, and children who are subject to nocturnal epilepsy also suffer this accident. It occurs in connection with albuminuric disorders, also when the urine is loaded with uric acid, urates, oxalates, or phosphates. Diabetic children suffer more or less from incontinence of urine. In all persistent cases the urine should be chemically examined.

Among the more common cases of enuresis is liberal indulgence in saccharine foods. Children who are allowed to partake plentifully of candies, sweets, cakes, pastries and other articles that are rich in sugar, and also to indulge in foods that are rich in fat and oil, are sufferers from this nightly trouble. In orphan asylums and in humble homes it is considered that a child is being fed a light diet if it is given a slice of bread with molasses for its supper, whereas children who are allowed to eat syrup in any form or to spread sugar upon bread are those among whom enuresis is most commonly observed.

Fruits that are rich in sugar also induce polyuria and children who are coffee drinkers, who are encouraged to use plenty of sugar in their coffee, as those who are treated to a liberal allowance of bread and milk for supper well sugared, are also common sufferers from nocturnal enuresis. Therefore, very close attention should be paid to the diet when it comes to the subject of treatment.

Another common cause of enuresis, especially of boys, is elongated or adherent prepuce. In girls the same condition obtains from hooded clitoris, while in both sexes rectal irritation, whether from lumbricoides, ascariæ, papillæ, peritis or other local ailment is a fruitful source of this disturbance, and here the principles of caecialism will often be found applicable in treatment. If erythema, eczema, peritis or other local irritation exists the skin may need attention before cure of the enuretic difficulty can be accomplished.

Symptoms.—The single symptom of enuresis is the involuntary escape of urine. The child may be free from the evidences of disease, apparently as well as other children, and yet suffer from that degree of incontinence that results in nightly wettings of the bed, or that keeps its clothing forever dribbled. The symptoms will depend upon the cause of the difficulty. If from epilepsy the incontinence must, of course, be considered as a single symptom of the case. If seen in association with rheumatism, lithemia or the wormy state, the symptoms belonging to these conditions will be present. As a rule the child lies upon its back and sleeps so soundly that it is not disturbed, at least not awakened, by the accident, its first consciousness of what has happened occurring when it awakens in the morning to find its clothing and that portion of the bed upon which it has been lying saturated with urine. If the trouble occur during the day while

the child is at play it is apt to experience more or less nervousness and pull or clutch at its genitals, and cry and jump up and down, fully conscious of what is going to happen, yet apparently unable to avoid the accident. When at the height of the excitement the sphincter relaxes and in an instant its clothing is saturated.

Treatment.—The treatment of enuresis will depend upon the cause, and where this is ascertainable it should be removed. If from pin worms, verminifuges and proper constitutional treatment should be instituted until the state of the bowel is rendered healthy. Lithemic and rheumatic states must be overcome by remedies directed against them. Nocturnal epilepsy requires treatment, and so on throughout the list of diseases upon which enuresis depends.

If due to a debilitated state of the health such constitutional remedies as *Calcarea*, *Thuja*, *Silica*, *Arsenicum*, *Ferrum*, *Coca*, *Indur* and *Sulphur* will be required. If due to debility of the sphincter muscle, and a relaxed condition of the muscular system generally, *Ferrum phosphoricum*, *Kali muraticum*, *Arsenicum*, *Strychnia*, and similar remedies will be called for.

Ferrum phosphoricum has proved to be one of the best remedies in incontinence in young children of enuretic habit, with relaxed muscular fibre, headache, and lack of childly vigor and tone.

Coca is especially suited to the irritations of the bladder that go with the wormy state. The child picks at its nose, is cross and irritable, restless during sleep, and suffers involuntary micturition under the influence of sudden excitement. The urine becomes cloudy and turbid soon after being voided.

Sepia will be found especially useful in nocturnal enuresis when occurring during the early hours of the night. The urine has an offensive odor, and deposits a white sediment.

Sulphur meets nocturnal enuresis with passing of large quantities of colorless urine. Urine is rose-colored and fetid.

Pulsatilla is well suited to cases of nocturnal enuresis occurring in pale, delicate children of tearful habit and lack of muscular and nervous resistance. Incontinence occurring through the day, the urine being passed drop by drop, the patient conscious of its leakage, but unable to control it.

Lycopodium is an excellent remedy in dyspeptic children who suffer nocturnal enuresis in connection with lithemic states of the system. The urine is highly colored, causing a pink circle on the child's linen or bedding.

Gelsemium, *Ignatia*, *Phosphorus*, *Asafetida*, *Chamomilla*, *Moschus*, *Alumina* and *Nux moschata* will be required in connection with the incontinence of choreic or exceedingly nervous subjects.

Benzoic acid, Berberis, Colchicum, Natrum muriaticum, Rhus tox., Lobelia, Bryonia and Phytolacca deserve consideration in connection with the enuresis of lithemia.

Cassia, Pulsatilla, Sanguinaria, Kali bichromicum, Conium, Cocculus and other remedies may be demanded for enuresis that occurs with coughing, sneezing and other sudden convulsive movements.

Hyoscyamus, Stramonium, Kali phosphoricum, Calcarea sulphurica, Natrum sulphuricum, Argentum nitricum, Kreamston and *Phosphoric acid* may be considered to advantage in special cases occurring in association with acute or chronic disorders of the nervous system.

DIET AND HYGIENE.—Enuresis is often the result of improper diet. With some children sweets, as sugar, syrup, candies (*Argentum nitricum*) and other sweet-meats are causes of enuresis. Not infrequently a change of diet from sweets to wholesome, nutritious food administered in moderate quantities, especially exhibited in light suppers, will altogether overcome the difficulty. All acid fruits, as strawberries, limes, lemons, oranges, etc., should be tabooed. Hot suppers of rich food or food that is difficult of digestion are often the cause of the accident. The enuretic child should be put upon light diet, especially at night, and its bladder and bowels should be emptied before retiring. If it retires early it should be roused at the time older children or its parents make ready for bed, and its bladder emptied at that time. Most cases of enuresis occur late in the night, or early in the morning, and a little care to arouse the child at the break of day and have it empty its bladder will avert the accident. In many cases it is due partly to inability on the part of the bladder to accommodate the quantity of urine that is secreted during the long sleeping hours of child-life. Hence the child should be aroused and the bladder emptied once or twice during the night.

CIRCUMCISION.—Circumcision is so often the certain cause of enuresis that it should be practiced in all stubborn cases. If the foreskin is adherent and elongated it should be separated from the glands and the redundant prepuce should be amputated, only the corona being left covered.

In girls so afflicted the condition of the genitalia should be inquired into and if the clitoris be tightly hooded and bound down it should be relieved. These measures will often be found sufficient in themselves to effect a cure.

It is well, also, to inquire into the condition of the rectum and give such attention to that pouch and the sphincters as their conditions may seem to demand, pockets, piles, papillæ, even tight sphincter, often sufficing to keep up an otherwise curable enuresis.

CHAPTER LXXXV.

DIABETES.

General Considerations—Diabetes Mellitus—Etiology—Symptoms and Course—Diagnosis—Prognosis—Diet—Hygiene—Medication.

General Considerations.—Diabetes is seen in two forms, diabetes mellitus, a constitutional ailment that is characterized by the secretion of an abnormally large quantity of urine charged with sugar, and diabetes insipidus, essentially a nervous affection, characterized by a large quantity of urine of low specific gravity without the presence of sugar. The latter form passes under the name of polyuria, while diabetes mellitus is termed glycosuria.

Diabetes Mellitus.—This form of diabetes is much more common to adults than children, but it is also seen in early life. The quantity of urine is very much increased over the normal and the presence of sugar is the pathognomonic symptom. The quantity of urine is not always large, and at some stage of the case it is not unusual for it to even be below the normal amount. The constant presence of sugar in the secretion is that which makes the diagnosis positive. Transitory glycosuria is common, and the occasional presence of sugar does not necessarily imply the existence of this form of diabetes. It is only when it is present persistently and when the quantity is considerable and permanent that diabetes mellitus is recognized. The continued presence of sugar in the urine is certain to result fatally, per disturbed nutrition, marasmus, liability to sudden coma, and the development of tuberculosis.

Etiology.—The cause of diabetes in children, as in adults, is obscure. It is believed that heredity has some influence upon the process, but in children the absence of the well known operating causes in adult life, as overwork, anxiety, grief, etc., makes it difficult to understand the reason for its existence. It has been attributed to disease of the stomach, kidneys, blood, nervous system and pancreas. It affects all ages, having been seen as early as the first year of life and in persons above seventy years of age. It occasionally follows upon severe injuries and shocks to the nervous system, and occurs, also, in the course of certain nervous disorders, as insanity, epilepsy, severe chorea, syphilis of the nervous system, and other organic conditions. The presence of sugar is accounted for in two ways: resultant from the food, directly, or indirectly, from the glycogenic function of the liver; or from the blood, from transformation of the fats and albuminoids. When it comes from the food direct, or is dependent upon interference with the glycogenic

function of the liver, the sugar in the urine will promptly disappear upon the withdrawal of starch and saccharose from the food; whereas, if it is due to transformation of the fats and albuminoids from the blood the sugar is still present no matter how much change may be made in the diet, though the quantity may be somewhat reduced if the objectionable articles of diet be withdrawn.

Symptoms and Course.—Diabetes mellitus sets in insidiously. It is usually preceded by dyspeptic and nervous symptoms, as loss of appetite, nausea, eructations, headache, disturbed sleep, irritability, and perhaps despondency, the first acute symptoms consisting of a frequent desire to urinate, the quantity being increased and the urine usually pale and limpid, this free flow of urine being attended by unusual thirst. The increased frequency of discharge is more noticeable at night, though it may be increased throughout the entire day and this fact escape notice in the day time. The specific gravity of the urine is increased to 1030, 1040, even to 1060, and examination of the urine discovers the presence of glucose. The urine foams readily on shaking, the foam persisting and being acid in reaction. The specific gravity corresponds in a general way to the quantity of sugar and other solid elements that are present. There may be a large excess of urine with but low specific gravity and still sugar be present. The quantity of sugar varies from one-half of one per cent. to from five to ten per cent. in severe cases. Albuminuria is sometimes present in association with diabetes as a result of irritation of the uriniferous tubules by the sugary urine, or it may occur co-incidentally with diabetes from the causes that operate to produce the latter.

The appetite is generally disturbed, more often decreased but occasionally voracious, because of the starvation process that is a part of the disease. There is generally progressive deterioration of health and strength, headache, anxiety, and nervous, troubled expression of the countenance; the skin is dry and scaly, boils, styes, *carbuncles* occur in the course of the ailment, and occasionally gangrenous processes and diabetic cataract complete the symptoms. In adults a sudden coma is liable to supervene along the course of diabetes, coming on suddenly and attended with heart failure and collapse. This is less common in children, but may destroy life during the course of diabetes in young subjects. The development of tuberculosis is the most common outcome of diabetes mellitus.

The disease is chronic in character, running its course in a few weeks or months, and in unusually acute cases lasting from two to five years in children in its more chronic types. In the lighter forms sugar disappears from the urine with the withdrawal of sugar and starch from the food, while in severer forms it remains

constantly present even though the quantity varies from time to time.

Diagnosis.—The diagnostic symptoms are the increased flow of urine, the constant presence of sugar, intense thirst, dryness of the mouth, rapid emaciation, dryness of the tissues, and neuralgic pains and formication of the skin, especially about the genitalia. In children who void in the diaper it is not always easy to secure chemical tests, but a possible diagnosis will have to be made from the general symptoms of the case. The higher specific gravity is also a differential diagnostic sign of first importance.

Prognosis.—The prognosis in children is bad. Diabetes mellitus in early life is not accounted a curable disease. By careful attention to the hygiene and diet of diabetic children an early fatal issue may be averted and life be prolonged for many years; but it is doubtful if complete recovery from confirmed diabetes mellitus in children ever takes place. If the emaciation is severe and rapid the pancreas is generally involved in the process, and the prognosis is made more unfavorable. If the disease arise from traumatism or derangement of the nervous system the prognosis is better. In a general way it is better in adults than in children. If the diabetic state be dependent upon other constitutional conditions that are amenable to treatment, while it adds to their gravity it may yet be a curable condition, and the prognosis be, therefore, more favorable than in the latter variety.

Diet.—It is well understood that the chief element in the treatment of diabetes is the exclusion of sugar and sugar-making foods. It is not possible to entirely eliminate saccharine, since it enters into the composition of so many articles forming the human diet; but the more limited the dietary the more satisfactory will be the treatment of the disease. Unfortunately articles like potatoes and bread that are rich in starch and that form such an important element in the food of mankind have to be prohibited. This is easier of accomplishment in children than in adults because their appetites and habits of diet have not yet become thoroughly formed into a second nature, so it were. Wheat flour contains seventy to eighty per cent. of starch, hence the necessity for almost or total abstinence from this article of food. Gluten flour has been substituted and forms an excellent article of diet. Liebig prepared ordinary wheat bread by treating it with diastase, by means of which the starch is converted into dextrine. This element is soluble in water. By soaking thin slices in water the bread is rendered innocuous and palatable when dried and toasted. Bran flour has been recommended and more or less extensively used, but children soon tire of it. Almond flour has also been resorted to, but none of these preparations answer as well as gluten flour, which can be made into biscuit, loaf bread, porridge, tea-cakes,

and other kinds of bread. It can be obtained from various health food companies and at most complete groceries.

Vegetables that are rich in starch are tabooed. The potato especially must be discarded. On the other hand green vegetables, as lettuce, celery, spinach, asparagus, young onions, cucumbers, and cabbage are not objectionable. Milk forms the basis of diet with most children, and with butter-milk and cream, to be used occasionally, there is but little difficulty in tiding over a diabetic crisis in child-life by means of this article of food. The conversion of starch into dextrine in the proportion given in Mellin's Food renders this particular article adaptable to the diet of diabetic children. It has to be prepared with milk, and the presence of milk sugar in it is not as objectionable as cane sugar.

Shell-fish, in fact all kinds of fish are allowable, and meats of all kinds, excepting liver—which should never form an article of diet—though if albuminuria be present meat should be partaken of sparingly. Game and poultry enter into the diabetic dietary; eggs and the green vegetables already named, with green string-beans, mushrooms, tomatoes, and other non-saccharine vegetables, also assist in forming a liberal menu.

As a matter of fact the permissible articles of food can best be reached by a process of exclusion, that is by excluding those that are harmful. The former list is very much larger than the latter, which covers potatoes, rice, beets, carrots, turnips, peas, beans, except green string-beans, and all preparations containing wheat flour. It goes without saying that an excess of spices and small liquors is objectionable, but it will be seen at a glance that the excluded articles are not sufficiently numerous to render the feeding of diabetic children a knotty problem.

Hygiene.—In diabetes care should be taken not to impose extra burdens upon the kidneys and liver. Gormandizing is harmful, and irregularity of feeding hours objectionable. The child's habits should be regulated to a nicety, and its general hygiene should be of the best. Moderate bathing is required to keep the skin open and performing its function, in order to relieve the kidneys as much as possible. Sudden suppression of the perspiration is always harmful; so, too, is chilling of the skin. Flannel should be next the skin day and night, the bowels should be regulated by proper diet and by acid fruits that are free of sugar. The child's exercise should be moderate; especially is violent exercise to be carefully avoided. Emotional states are harmful. In fact, anything that severely taxes the nervous system, the muscular system, or the digestive powers of the patient retards recovery and protracts the case.

While diabetes is seen in all climates yet it usually occurs in cold and changeable zones; and one of the best measures that can be adopted in the treatment of this disease is the change to a warm,

dry climate where the skin will relieve as much as possible of the tax that is thrown upon the kidneys, and where, because of the climatic conditions, the patient can be in the open air, and if able to lie up and about can enjoy moderate outdoor exercise during every day of his illness. While the treatment of diabetes is largely dietetic, these aids of general hygiene and climatology should not be excluded.

Meditation.—Diabetes is essentially a chronic disease, the remedies that will be found useful in its treatment are few in number, and in order to produce proper effect should be continued over a considerable length of time, not often changed nor often repeated. Among them will be found *Uranium nitrate*, *Mercurius corrosivus*, *Apis mellifica*, *Strychnia*, *Phosphoric acid*, *Fluobism*, *Aceticum*, *Argentum nitricum*, *Terchinthina*, *Carare*, *Phosphorus* and *Lycopodium*.

Uranium nitrate is especially recommended in hepatogenic diabetes, with defective digestion and assimilation and plentiful deposit of sugar in the urine. The child is languid, debilitated and in a generally unwholesome condition. It has purulent conjunctivitis and an offensive nasal and aural discharge. The quantity of urine is large, and the child emaciated and scrawny.

Phosphoric acid is especially indicated in glycosuria of nervous origin, with debility from a loss of vital forces. The urine is thick, like milk, and contains much sugar. Puruncles, onychia and sluggish sores add to the child's discomfort, and its weakness and emaciation are extreme.

Terchinthina, in which the disease-casts appear in the urine, is homeopathic to the pathology of the disease. The child is intensely thirsty, its features are sunken, its gums spongy, its lips cracked and bleeding, and its state generally miserable, irritable and peevish. There is a marked distaste for animal food, and distress in the stomach and hypochondria. The child is compelled to urinate often, and albumin is seen in connection with sugar.

Strychnia is highly recommended in the tincture and lower attenuations, as capable of diminishing the quantity of urine secreted and causing the disappearance of sugar in the urine.

Natrium sulphuricum is useful in hydrogenoid conditions with pancreatic symptoms, and general disturbance of the gastro-intestinal canal. The food is not assimilated, the patient is jaundiced and sallow. Tuberculosis threatens and perspiration and debility are pronounced. There is dryness of the mouth and throat, great thirst for cold drinks, and intestinal dyspepsia with foetid flatulence and continued sensation of chilliness.

Phosphorus is especially adaptable to diabetes in tuberculous subjects, with evidence of the oncoming of tuberculosis. Face is pale and yellow, heart's action weak, dyspnea and rapid breathing

pronounced, and the condition one of general anemia. The urine is copious and pale, or whitish, like curdled milk. *Phosphorus*, *Arsenicum*, *Iodum*, and *Natrium sulphuricum* are considerably alike in their digestive symptoms. Lilienthal divided the symptomatology of these and other drugs into two classes: Those symptoms that are seen in association with pancreatic or digestive disturbances, and those dependent upon the diabetic state. In no remedy are the pancreatic symptoms more pronounced than in *Phosphorus*.

Arsenicum album presents the usual physiognomy of this drug in diabetic subjects. The face is pale and puffy; there is thirst and irritability of the stomach, diarrhea, neuralgic symptoms, palpitation of the heart, and the characteristic *Arsenicum* restlessness and anxiety. The urine is increased in quantity, and as it becomes copious thirst is unquenchable. Emaciation and extreme debility, with swelling of the feet and general dropsical symptoms, are seen in the late stage of the disease. For diabetic gangrene there is no better remedy than *Arsenicum*, though *Lachesis*, *Secale*, *Carbo vegetabilis*, *Phosphorus*, *Kali phosphoricum* and other remedies are deserving of consideration in this connection.

Iodum will be found a useful remedy, especially in association with *Arsenicum*, in diabetic children whose emaciation is rapid and extreme, who are always hungry, who eat voraciously and yet who continue to grow thinner, gradually starving from non-assimilation of the food. Fat appears in the stools, the abdomen is distended, the mesenteric glands are indurated, the skin is leathery and sallow and the lungs become affected. The urinary symptoms are not as important as the general systemic picture. The hands and feet are cold, the skin rough and scrawny, the urine is copious and bright yellow, or milky with a dark sediment.

Arenia will be thought of in connection with glycosuria as a result of injury.

Podophyllum, *Iris*, *Leptandrin*, *Mercurius*, *Nux vomica* and *Sulphur* are especially adapted to glycosuria depending upon disturbance of the liver and gastric functions. *Antimonium crudum*, *Iris* and *Ipecac* may be called for where the disturbance of the stomach is pronounced, but are not likely to be especially curative.

Plumbum and *Arsenicum bromatum* may be required in special cases in which albuminuria is associated with diabetes. *Mercurius corrosivus* is also occasionally called for in this state.

Lycopodium is a remedy of first importance in children when associated with intestinal indigestion, with borborygmus and flatulence, lithemia, uric acid diathesis, with the characteristic red sand in the urine. In young girls of phthisical habit, and

in children in whom diabetes and incipient tuberculosis are associated, following upon acute exanthemata, *Lycopodium* will be found to be an excellent remedy, rivaling *Sulphur* in this connection.

For the nervous symptoms that occur late in the course of diabetes *Carava*, *Strychnia*, *Zincum*, *Cicuta*, *Helleborus* and *Glonoinum* may be demanded.

The more carefully the remedy is made to meet the systemic picture presented in each individual case the more certainly curative will it be found. Individual symptoms will present in individual cases that call for individual remedies as intercurrent medicines, but in the treatment of diabetes it will be found better to select a given remedy according to the entire pathological and symptomatological picture of the case and adhere to it over a good period of time than to change remedies often in efforts to overcome individual symptoms that continually crop out. In a general way the pancreatic or digestive remedies will be found more certainly beneficial than those selected with special reference to the urinary symptoms. The main reliance will be upon diet, hygiene and climate, aided by medication directed toward perfect digestion and assimilation of food.

SECTION IX.

DISEASES OF THE SKIN.

CHAPTER LXXXVI.

ERYTHEMA.

Etiology—*Simple Erythema*—*Treatment*—*Erythema Intertrigo*—*Treatment*—*Moluscum*—*Erythema Multiforme*—*Site*—*Symptoms and Course*—*Diagnosis*—*Treatment*

Etiology.—Children and youths are more subject to erythema than infants and elderly subjects. It is frequently observed in young adults also. It seems to be without specific causation, depending upon disorders of digestion, simple fevers, exanthematous fevers, rheumatism, lithemic states of the blood, and is sometimes apparently of neurotic origin. In a case at present under the author's observation the appearance of the eruption alternates with sensations of numbness and tingling of the arms and hands. It not infrequently happens that a child may complain of a limp condition of an arm or limb and be troubled with general lassitude, lack of appetite and a certain degree of irritability, all of which symptoms promptly clear up at the appearance of an erythematous rash.

In these cases it seems to be due to vaso-motor disturbance, which, in turn, is probably due to some systemic state not as yet fully understood. Children who indulge in sweets, acids or the excessive use of alkalis are the usual subjects of erythema, while those whose systems are possessed of a dyscratic base, especially tuberculosis, are more subject to the nodose variety.

In severe manifestations of erythema, no matter what its type, there may be hemorrhagic petechiæ, generally superficial and appearing as purpuric spots.

Simple Erythema.—Children are subject to various inflammatory diseases of the skin, among the more common of which is simple erythema. This appears as a diffused or circumscribed hyperemia or discoloration, appearing upon pressure and fading away within a few hours or a day or more from its appearance without very positive symptoms. There may be slight burning and tingling, and, as a trifling degree of furfuraceousness follows, there may be more or less itching.

Erythema may occur as an idiopathic ailment or, it may be, in association with other ailments, occurring as a symptom only.

Some children are subject to erythematous blushing of the skin in connection with attacks of indigestion, simple sore throat, trifling exhibitions of fever, simple diarrhoea and from other like causes. It also occurs from the use of certain drugs, as *Quinine*, *Belladonna*, *Cantharis*, and various acids. It is observed also as the result of eating pickles, lemons, and other acid foods. More rarely it is seen from exactly the opposite cause, the use of soda in food. This type of erythema is a very simple ailment and generally takes care of itself upon the withdrawal of the food, sweets or other articles of aliment upon which it depends. If occurring idiosyncratically or as a symptom of some trifling disturbance of the system the relief of the primary condition results in its disappearance.

TREATMENT.—As a rule it is not necessary to prescribe for the simple variety of erythema. If there be itching, burning and tingling of the skin *Aconite* or *Belladonna* may be exhibited with benefit. If the child be of nervous type and suffers out of proportion to the nature of the affection *Chromocolla*, *Apis*, *Cantharis* or *Terebinthina* may be required. The application of the hot bath is also beneficial.

Erythema Intertrigo.—Intertrigo is a simple hyperemia of the skin that becomes aggravated by neglect of the proper infant hygiene, being observed more commonly about the folds of the groin, nates and in the folds of skin of fleshy babies. In severe cases the epidermis becomes inflamed and subsequently softened, exfoliating in macerated rolls when lathered or rubbed after being neglected for some time. If the child's skin is irritated by the urinary secretions and perspiration there will be an offensive mucopurulent discharge, which increases the inflammation, even causing the skin to be fissured.

Intertrigo also appears about the folds of the neck in fleshy children, under the knees and wherever the folds of the skin lie in contact. In severe cases it causes a good deal of inconvenience and is not always easily differentiated from eczema. It may also be confused with the erythematous syphilide of young subjects, this being more commonly observed upon the buttocks and genitals, which parts are the frequent sites of the intertrigo in neglected infants. The syphilitic symptoms develop downward, extending on the thighs, even down to the feet on the posterior surface of the leg, while infantile intertrigo, being a local ailment, is usually confined to the site of irritating secretions, hence rarely extends beyond the nates and upper portions of the thighs that are covered by the diaper.

TREATMENT.—Cleanliness is the *sine qua non* in infantile intertrigo, frequent bathings and thorough drying of all creases and folds of the skin usually effecting a quick cure. It may be

well in the severest cases to wash the child, especially about the buttocks, with carbolized water, with subsequent washing of pure water and thorough drying by mopping with absorbent material. The application of drying powder, as the club moss, talcum powder, rice powder, and other innocent substances is helpful. Zinc powder and similar chemical preparations, while sometimes exceedingly effective, are objectionable lest by the quick chemical healing they induce there may be metastasis to other portions of the system. Bismuth powder, salicylic acid, thymol and tragacanth are also employed.

MEDICATION.—If the skin is considerably inflamed *Aconite* or *Ferrus phosphoricum* may be exhibited with benefit. *Belladonna* and *Chamomilla* are also useful in allaying the nervous symptoms that arise from the integumentary irritation. If the skin becomes unwholesome and fissured, with crustaceous formations thereupon *Graphites*, *Arsenicum*, *Tinaja* and *Kali muricatum* may be required.

Erythema Multiforme.—Children are subject to a form of erythema that is in special cases exceedingly annoying and unresponsive to medication. The multiform type is an exudative disease of the skin showing in a number of varieties, from the papular to the nodose, or severest form. The multiform type is attended by constitutional symptoms prior to the development of the eruption, and during its course in the severest cases there may be more or less languor, sore throat, general disturbance of the digestive organs, especially anorexia, rheumatoid pains, headache, irritability and slight fever. The first manifestations of the eruption are the development of the papules, attended by burning and itching sensations at their site. These may occur upon the trunk or limbs of both. If the eruption becomes general, initiatory to the erythematous form, the skin will be generally reddened with raised papules appearing over its surface in concentric rings or as individual elevations. As commonly observed the papules appear singly, with here and there an aggregation consisting of a number of points, varying in size from a millet seed to a split pea. In some cases they are of pinkish color, in others bright red, and in still others become purplish. As the patch fades away it leaves a ringed appearance which has given to it the name of erythema annulare. Where it appears as broken lines and irregular aggregations it has been denominated erythema gyratum. If made up of diffused patches that have irregular margins, with an occasional development of nodes therein, not unlike the elevation and roughness of the margins of the simpler form of lupus—though, of course, in much milder form and less important—it is termed erythema marginatum. There is also the vesicular form, the bullous variety, and, in tuberculous subjects where the tubercular nodules appear in an affected area there is the form termed erythema

tuberculatum. There is also a variety termed herpes iris that is symmetrical and seen more often on the backs of the hands and feet as an eruption with an erythematous base and occasional appearance of conical vessels. As these form and die down a number of shades of color are seen upon the erythematous patch at the same time, hence the name herpes iris.

SITE.—The common site of erythema multiforme, no matter what the variety, is the dorsum of the hands and feet. Other portions of the body may suffer rarely. The tuberculous variety especially is observed upon the hands.

SYMPTOMS AND COURSE.—Commencing with sensations of burning and tingling there soon comes an actual warmth of the skin at the site of the eruption with subsequent redness and slight elevation; the papule, somewhat elevated above the level of the surface of the skin, forms in twenty-four to thirty-six hours after the first symptoms, the commencing eruption in the simplest types going on to vesiculation, nodosities and to the formation of the bullæ in the individual types bearing these names. The usual course of the ailment is from two to four weeks. In the papular variety slight desquamation and discoloration of the skin follow the fading of the papules. The vesicular and bullous types go on to vesication within two or three days or a week; in the rainbow variety there is vesiculation and scaling, leaving discoloration of the integument, while others promptly appear and go through the complete processes of vesication and incrustation. A rough rose-rash occurs whenever there is considerable headache and fever, and is sometimes seen independently of the forms of vesication and bullæ. In the nodose variety the initial symptoms are about those found in the simpler types, but here the lesion consists of single nodosities which are large and painful in unusually pronounced cases, showing an area of inflammation extending over the size of a silver dime to a silver dollar. These are usually red and inflamed, are hard and tense and more or less painful. They appear more commonly on the anterior surface of the thighs and are accompanied by burning, tingling, itching and, in some cases, nightly rheumatoid pains. As they mature the affected area becomes softened, giving the appearance of commencing abscess. This result does not follow, however, the type fading away into pustulation in some instances, and dry scurfing of considerable-sized crusts in others.

DIAGNOSIS.—There is not much difficulty in making a diagnosis of erythema multiforme. It is somewhat like urticaria, but the eruption is more permanent. It is not attended by the degree of itching that is common in that rash, is not so directly traceable to the use of drugs, as *Quinine*, or to indiscretion in diet, and the erythematous patches are more widely distributed, not appearing in the wheals peculiar to urticaria. It is not so apt to be attended

by gastric derangement, as deathly nausea, even vomiting, nor is it often traceable to disturbances of the hepatic function. The papular variety of eczema itches intensely and the rash is more permanent. The papules are more sharply defined, they desquamate more plentifully, and if there be a disposition to moisture between the papules the inflammation of the skin is more intense.

It is not very likely that the nodosities of erythema will be confused with those of syphilis or tuberculosis. These diseases have their own profound constitutional states with traceable history. Even in the absence of positive evidence of the pre-existence of syphilis the condition of the teeth, the rhagades and mucous patches, together with other constitutional indications, will make the diagnosis fairly clear.

TREATMENT.—The treatment will depend upon the cause of the individual case. If due to the rheumatic diathesis or the lathemic state treatment will be directed accordingly. If engrafted upon a syphilitic base or founded upon a psoric base the iodides of *Arsenicum*, *Kali*, *Baryta* or *Calcarea* may be demanded. *Sulphur* will often set to right the systemic conditions and promptly clear up the skin trouble.

If there be intense itching or burning *Arsenicum*, *Kali murianum*, *Sulphur* or *Cantharis* may be required. If erythema nodosum be the form observed, and the nodules are persistent and unresponsive to simpler remedies, *Arsenicum iodatum*, *Psorinum*, *Sulphur* or *Tuberculinum* may be exhibited with benefit. *Lycopodium* will be found a helpful remedy where, in association with the skin eruption, there are irritability of the bladder, flatulent dyspepsia, red sand in the urine and other *Lycopodium* symptoms. Local applications are not, as a rule, demanded. If itching be intense the spots may be washed with a weak solution of bicarbonate of soda water, or with carbolized water. If the nodosities are sore and inflamed, besides the proper exhibition of the constitutional remedy, it may be well to treat them externally with applications of calendula, arnica, or boracic acid. The internal and external exhibition of *Thuja* is also a measure of value in erythema nodosum. The lead washes, zinc ointments, domestic salves and other applications of this character should not be used. By their application the skin eruption is simply suppressed, and subsequent constitutional symptoms often follow. It is better that the efflorescence be allowed to develop in full blossom upon the skin than that it be transferred to the mucous membranes, there to set up bronchitis, gastritis, diarrhea or, perhaps, irritation of the kidneys and bladder.

Erythema that goes with rheumatic inflammation of the joints and that is observed as a symptom of or subsequent to any of the exanthemata will be better met by remedies directed toward the primary condition.

CHAPTER LXXXVII.

ECZEMA.

General Considerations—Etiology—Varieties—Symptoms and Course—Pathology—Diagnosis—Treatment—Local Treatment—Medication.

General Considerations.—Eczema is among the more common types of inflammatory diseases of the skin, belongs to all ages of life, is non-contagious, and is characterized by itching, burning, and sometimes by aching pains, with more or less moist exudations from the affected area, in severest cases showing extensive desquamation, fissures, and even superficial ulceration in places, with thickening of the integument, and a generally unwholesome state of the skin over affected portions.

During infancy it is especially apt to recur unless eradicated by proper direct constitutional remedies. The peculiar features of this type of skin disease are its multififormity of lesions and its stubbornness and persistency. It may appear as a vesicular disease, its vesicles exuding a sticky serum which forms in crusts that dry and scale off, or that may be closely adherent to the structures beneath, either aggravating the condition from pressure, increasing the irritation, and their forcible removal leaving the exposed surface tender and bleeding; or it may appear in the dry scurfy form without the least tendency to the formation of vesicles. In other cases it may show a conglomeration of papular, vesicular, pustular and erythematous rashes, all present at the same time in the same subject. It may appear in isolated spots, it may show as an affection of the integument of the face or scalp, or both, or the entire integumentary covering of the body may be the seat of the disorder, which then very properly goes under the name of *eczema universale*.

There are moist types and dry types. There is a squamous form and the inflammatory form. It is seen in the hovels of the poor and in the mansions of the rich. It is observed in hand-fed babies but also marks or disfigures the features of babies otherwise apparently well who depend upon the maternal nourishment for support, and in whom its existence is not easily explained. In some subjects it seems to depend upon a constitutional taint of prenatal origin, while in others it is directly due to errors in diet. In bottle-fed babies it is more commonly observed upon those fed upon prepared foods containing an excess of starch; in lymphatic subjects of older months and the first few years of childhood its appearance is incited and it is kept up by the too

free use of potatoes, rice and fat foods. In children of psoric taint who are anemic and debilitated it seems to be due to an impoverished state of the blood.

Etiology.—In a great many cases the tendency to eczema seems to be inborn. Parents who have had eczema are likely to see the disease develop in their children, though this is not an invariable rule; nor is it believed that the disease is directly hereditary as syphilis and some other diseases are accounted hereditary. Its appearance in the offspring of eczematous parents is due more to the fact that such children are possessed of a type of integument that affords good ground for the development of eczema, rather than that the disease itself is transmitted to them.

It is observed that it occurs more commonly upon children whose parents are tuberculous or syphilitic; it is a universally accepted fact that strumous subjects afford excellent eczematous material. Children with swollen glands, with suppurative formations of ear disease and blepharitic inflammation form a type in which eczema is common. Children who are ill-nourished, whose sanitary surroundings are not good, whose food is unwholesome, are more commonly afflicted than those of robust constitution, whose lives are pursued in better surroundings. Yet even the healthiest children do not escape. Some of the worst cases the author has ever witnessed have been in children of sturdy frame and robust health, whose cuisine was of the best, whose habits were vigorously hygienic.

Anti-vaccinationists contend that a great many cases of eczema are caused by vaccination, and it is not unlikely that this claim is well founded, since it has come to be a well accepted fact that a great deal of the virus in common use for vaccinal purposes is of questionable purity.

The use of harsh soaps in the toilet of very young infants is doubtless responsible for a share of cases; and, on the other hand, the neglectfulness of a careless nurse in the infant's first bath and for the first few days of its life is doubtless responsible for the development of many cases of infantile eczema, especially *eczema capitis*.

The pustular variety is more commonly due to the use of fat foods, especially pork and lard, in children of psoric taint.

Varieties.—Eczema is divided pathologically into *eczema erythematosum*, *eczema papulosum*, *eczema vesiculosum* and *eczema pustulosum*. These terms explain themselves. The erythematous variety is unusually widespread, though it may be confined to small patches. The skin is slightly inflamed, raised somewhat above the surrounding surface, burns and itches intensely and throws off a fine epidermic desquamation.

The papulous variety is generally ingrafted upon the erythematous, showing here and there the presence of finer or coarser

papules, forming dry scales that upon being exfoliated leave a tender, red, raised papule, which again scurfs.

The vesicular variety is characterized by the formation of vesicles. These may be very minute or coarse. In many cases they have the general appearance of the vesicles common to ivy poison; in others the vesicles are coarser and more scattered. They exude a clear, sticky serum, so excessive in some cases as to keep the part moist most of the time, necessitating constant dressing, while in others the exudation crusts and forms heavy scales or incrusting masses, these being lifted off by the further exudation of serum, or, in individual instances, drying so firmly and being so closely adherent that they are removed with difficulty, leaving the parts beneath sore and inflamed, especially at their edges.

The pustular type is rarely seen alone. It is generally associated with the erythematous or vesicular form, yet if considerable-sized pustules develop upon pre-existing vesicles it is less actively inflammatory than the vesicular type. The pustules are more commonly seen upon the scalp and face and as they rupture the discharge forms thick, yellowish, greenish or brownish crusts. This type is usually chronic and is that form of eczema that is denominated *eczema impetiginosum* by some authors.

Further classification of eczema is its division into a squamous form, in which the chief characteristics are the extensive redness, thickening and infiltration into the skin with a variable or general degree of scaliness. It is an aggravated form of either the erythematous or papular type. It is often seen upon the scalp and face and is also observed very commonly about the joints. In some cases the inflammation and itching are intense, while in others they are insignificant. The amount of scaling that occurs in the most pronounced types of squamous eczema is almost incredible. In one case observed by the author in adult life the scaling occurred by the handful every night, considerable quantities of loose epidermic scales being shed during the nightly hours.

Eczema rubrum is a type that is characterized by redness of the surface and the exudation of a sticky serum, attended with more or less thickening, infiltration and swelling of the skin. The serum may be clear, yellow, even bloody. It dries into thick crusts, usually yellow in color in children, but reddish-brown in adults. This form has been termed *eczema malidans*, or the weeping variety, because of the degree of moisture that is exuded. The exudation causes a great deal of discomfort and is attended by burning and itching. It is a type of eczema more commonly growing out of the vesicular form. In elderly subjects it is more commonly observed upon the lower leg, leading to eczematous ulcers, the chronic inflammatory ulcer of fleshy eczematous subjects, while in children it is more common about the face and scalp, in the severest cases being attended by excessive inflammation of

the face (Fig. 3, Plate I), distorting the features, and, because of the accumulation of serum that dries into crusts, cracking and fissuring over almost the entire face, the unfortunate subject is exceedingly repulsive in appearance. In special cases the inflammation is less pronounced and the cracking of the dry exudate is so characteristic as to give to it the name of *eczema fissum*.

Symptoms and Course.—The more common sites of eczema in infants and young children are the forehead, cheeks, scalp and posterior cervical region, especially back of the ears. Eczematous inflammation is often seen, and next most commonly, about the flexures of the joints and backs of the hands. It begins by the development of a minute patch of redness which is somewhat raised above the surrounding integument, and which is attended, even in its earlier stage, by heat, redness and slight edema. If of the simpler type the symptoms are not very pronounced, and a considerable area of integument may have become involved before it is observed that a distinct disease is present.

If of the popular variety sharply defined patches of redness come up quickly, with more or less pain and inflammation, and, in some cases, attended by fever and disturbance of the stomach.

If of the vesicular type, clear, watery vesicles, minute in size, will be observed over the inflamed area, a feeling of roughness be imparted to the skin upon touch, and examination with the finger will cause the vesicle to break and show a slight degree of exudation of clear serum. In pronounced cases this weeping is continuous, necessitating frequent mopping in order to avoid the irritation that follows drying and incrustation of the discharged fluids. If the flexures of the groins, knees and arms are the site of the eruption there is more or less of pain and tenderness upon motion of these parts, the sensitive skin of this region becomes inflamed and irritable and itching is more or less pronounced, in some cases intolerable.

Eczema erythematosum may burst forth in a single night into full blossom on the skin of the forehead, cheeks or other affected site. The child has slight fever, the skin becomes red, shiny and hot, the itching is almost as intense as in urticaria, and the little subject will scratch until its skin bleeds, if allowed to indulge the tendency, within a few hours from the time the first signs of the inflammation are observed. There will be slight oozing of a serous discharge, which quickly dries and crusts, in some cases falling off in flakes, in others adhering so closely as to cause soreness at the edges of the dry mass.

While various types of erythema are more commonly seen about the buttocks and genitals, from lack of proper attention and prompt removal of soiled napkins, yet these parts are not infrequently the seat of eczematous inflammation as well, in which case the infant is rendered still more unhappy, the symptoms being

aggravated by the contact of the urine and feces with the inflamed surface.

The course of eczema, no matter what its type, is essentially chronic. In a fair share of cases taken in hand promptly the exhibition of well-selected constitutional remedies and local cleanliness will suffice to promptly overcome the inflammation; but this disease so often depends upon a peptic base and upon faulty feeding that it refuses to remain cured, often re-developing in subjects in whom it was supposed it had been entirely eradicated. It follows individual sufferers through life. The simpler types in childhood are readily curable, provided the patient be given the benefit of proper hygiene and nourishment, and provided, further, the proper antipeptic remedy be administered over a considerable length of time.

Pathology.—Eczema is purely an inflammatory process characterized by hyperemia of the skin, this varying in degree according to the intensity and duration of the disease and the susceptibility of the subject, and followed by exudation. The rete and papillary layers are especially involved. In unusually chronic cases the corium is also the site of the inflammatory process, and in severest cases the subcutaneous tissue becomes affected. When the entire inflammatory structure and underlying tissue is involved in the process the skin is thickened, raised and rough. Examination under the glass shows its pores to be greatly enlarged, its epithelium exfoliating and the entire inflammatory structure infiltrated and hypertrophied.

Diagnosis.—The simpler types of eczema will have to be differentiated from erythema. This differentiation has been outlined in the discussion of the diagnosis of that ailment. In lichen the papules are larger and more discrete. It is not likely that eczema need be confounded with urticaria, which rises in wheals that burn and itch intensely, that develop suddenly, that are usually always seen in association with acute gastro-hepatic disorder and that are quickly disseminated. Urticaria is always dry; eczema is usually moist. The pustular variety of eczema is sometimes confounded with scabies. The latter is contagious and can generally be traced to a direct exposure. The former is never contagious and therefore is not traceable to a specific cause. Erythema of the buttocks and thighs in diapered children will be differentiated from eczema by the prompt cure of the former upon proper hygienic practice, and by the fact that there is not present the exudation of the sticky serum belonging to the moist variety of eczema. The papular and pustular varieties of syphilide are not unlike those of eczema, but the previous history of the case, the presence of the notched teeth, mucous patches and oral rhagades will determine the diagnosis. Eczema capitis, when severe, may be confounded with tinea favosa. The latter is due to a specific

parasite, is intensely contagious, the glands of the neck become infected and in especially severe cases patches of tinea may develop over the body and limbs from migration to these parts and its lodgment upon the hair stems in whatever part of the body they may be located. By careless observers eczema may also be confounded with ring-worm, another parasitic disease which should not be confused with any other form of skin ailment.

Treatment.—The successful treatment of eczema will have to be constitutional in every instance, and in individual cases it will be found necessary to combine internal medication with local treatment in order to obtain the best results. In all cases it is necessary that the child should be given the benefit of fresh air, out-door exercise, regular habits, nourishing, plain, wholesome diet, abstention from rich foods, as pork, pastries, gravies, butter, cheese and similar articles of diet, and also avoidance of acid fruits, pickles, irritating condiments, tea, coffee and other stimulants. It should go without saying that young children should not be allowed the foregoing articles of diet and drink at any time, even in the best of health, while when suffering from eczema these and perhaps a few other articles yet to be mentioned must be religiously tabooed.

In children who are bottle-fed or hand-reared there should be a strict avoidance of foods rich in starch; potatoes are pernicious, oatmeal is especially so, and reference to the chapter on "Infant Feeding," will indicate a number of prepared baby foods that must be objectionable in the dietary of eczematous infants. Sugar is especially irritating and rich cream should be sedulously avoided. In older children who are subjects of this disease the same care is necessary in the selection of nourishment that is demanded in infancy. Too-free indulgence in a meat diet will retard recovery, and efforts at cure might as well be abandoned at once if children are to be indulged in their whims for candy and other sweets, sugar, butter, rich cream, fat meats, especially pork, rich pastries, puddings, and the like.

LOCAL TREATMENT.—Local attention to the skin is necessary, but the idiosyncrasies of individual subjects will have to be studied. To some children the water bath is intensely irritating and should only be indulged in as absolutely necessary for purposes of cleanliness. With others it is always grateful. To some skins it is irritating, to others soothing. The itching and inflammation will be allayed in some subjects by the addition of soda or salt to the bath, while in others these substances are exceedingly obnoxious, and an acid bath, preferably carbolic acid, is comforting. In a general way bathing is exceedingly objectionable. Some authors go so far as to lay down the law that eczematous skins should not be washed at all, and in the main this mandate is supported by experience; yet in some subjects, especially where there is con-

siderable exudation and a tendency to an unwholesome state of the skin the bath is absolutely required. When demanded it is better as a rule to give it hot and medicated to suit the peculiarities of the subject. *Calendula*, *Arsenic*, a very weak solution of *Cantharis*, and in rare cases a medium alcoholic attenuation of *Rhus tox.* added to the bath will be found soothing. The intense itching and burning that follow the application of water to an eczematous surface will usually be relieved by the exhibition of *Sulphur* internally. In other cases *Rhus* will be required. Sedative lotions are sometimes necessary to the comfort of the patient. Here carbolic acid, glycerine and alcohol, applied two or three times a day or oftener, will be found helpful.

In the vesicular variety *Rhus tox.* and *Cantharis* in the sixth attenuation or higher added to distilled water will often be grateful when locally applied. Lead washes, zinc ointment, copper solution and lotions impregnated with opium are not usually beneficial. They may give temporary relief, but most often succeed in causing metastasis of the inflammation to other localities. *Eucalyptus* is among the best local applications that can be used. Thymol, salicylic acid, resorcin, lanolin and other substances have been applied locally with varying degrees of success. As a rule local treatment is disappointing; in general constitutional treatment is curative, though in individual instances the disease is so stubborn that treatment will have to be extended over a long period of time in order to be effective.

MEDICATION.—Remedies that will be found especially beneficial in eczema are *Arsenicum*, *Calcaria*, *Thuja*, *Kali muraticum*, *Natrum muriaticum*, *Natrum sulphuricum*, *Sulphur*, the various combinations of *Iodine*, *Potassium*, *Rhus tox.* and *Sepia*.

Arsenicum album is among the best general remedies for the treatment of chronic eczema. It has an eruption upon the scalp and face that is dry and scaly, or there may be pimples and vesicles upon the face, with acrid, even fetid discharge, with intense burning and itching. The same character of eruption also appears upon the legs and genitals. As the eruption dries there is scaling of a bran-like, furfuraceous character, especially about the forehead and margins of the hair. *Arsenicum's* eczema is likely to be seen in children who are debilitated and anemic.

Calcaria carbonica is a remedy of superior value in the eczema of children, especially lymphatic subjects with large heads, blue eyes and light hair. The eruption is mostly dry, but a thick, bland pus forms under the crusts. It is the *Calcaria* type of child that calls for the remedy more than special characteristics in its eczema. Children with chronic sore eyes, otitic discharges and general unhealthy skin are likely to need *Calcaria carbonica*.

Sepia is especially useful for eczema that occurs about the bends of the joints and behind the ears; for subjects of humid eczema

with vesicles on a red base on different parts of the body with intense pruritus. The eruption is at first dry but soon becomes moist and discharges copiously. The skin becomes dry, cracked and exfoliated. *Sepia* is particularly useful in eczema engrafted upon erythema about the genitals.

Sulphur is very much like *Calcareo* in its general constitutional state and eczematous features. There is a dry, offensive, scabby, easily-blooding eruption. The *Sulphur* eczema is seen more particular about the margins of the hair, especially on the neck. Children whose skins are unhealthy, who are marasmatic, in whom dry eczema occurs with enlargement of the glands, intense itching at night, with offensive, thick pus exuding from under yellow crusts, seen more especially about the chin, neck, fingers and toes, will be relieved by *Sulphur*.

Graphites is an excellent remedy for eczema in blonde, fat children who are subjects of sore eyes and eczema of the scalp and about the ears. The *Graphites* eczema exudes a moisture that forms in thick, yellow crusts. It is not painful but the eczematous spots itch and burn, especially at the margins of the crusts that form thereon. The characteristic indication for *Graphites* is the yellow serum with its heavy, dry, fissured, yellow-crust formation.

Hepar sulphur is especially applicable to the humid eczema of the scalp which is sore and sensitive to the touch; eczema on the genitals, scrotum and thighs exudes an offensive odor. Pustular eczema, with sore and indurated boils on the neck, calls for *Hepar*. It will often be found beneficial in crusta lactea, tetter, rhagades, excoriations and fissures that are exceedingly sensitive. In this it is directly opposite to *Graphites* whose sores and eruptions are not usually sensitive.

Mercureum is better suited to eczema of lean subjects and eczema seen upon parts not underlain with fat. The eczema is dry and the child scratches incessantly even until it bleeds.

Kali maritimum is among the best remedies for eczema with a thick, whitish, opaque, mucopurulent discharge. It differs from *Graphites* mainly in color of discharge. I have found this remedy one of the most satisfactory that I have used in recent years in the treatment of eczema capitis and moist eczemas in general.

Rhus tox. is another excellent remedy for the vesicular variety, the vesicles forming with red areola on which forms a thick crust and hard, horny scabs attended by offensive discharge and itching, worse at night, leaving the surface raw and excoriating. The *Rhus* eczema is worse in damp weather and in winter.

Thapsia is very often called for in skin affections following upon vaccination and in subjects of syrotic taint.

Potulonea has yellowish-green, thick crusts on face and neck which discharge profusely and are irritated at the margins. This

remedy is useful in salt rheum and eczematous eruptions about the knuckles and finger joints.

Kali sulphuricum is beneficial for the effects of ivy poison with subsequent outbreaks of vesicular eczema. They discharge a yellow, slimy, sticky secretion.

Kali bichromicum will be found helpful in eruptions about the ears with greenish crusts from beneath which oozes a whitish, thick matter. This remedy and *Sulphur* are especially required in eczema attended by boils and pustulations, though *Ithar sulphur*, *Calcareo*, *Thuja* and perhaps other remedies may be found helpful in the same condition.

Besides the remedies mentioned others that will bear study in this connection are *Dulcamara*, *Baryta*, *Mercurius*, *Natrum muriaticum*, *Rhus venusta*, *Anacardium*, *Calcareo sulphurica*, *Lycopodium* and *Iodum*.

For acute inflammation of the skin in connection with eczema, the skin being painful and exceedingly sensitive to the touch, the child feverish and irritable, *Acute*, *Apts*, *Cantharis*, *Terebinthina*, *Arsenicum*, and *Rhus* will be demanded. In confirmed eczema capitis, the head being a mass of scaly crusts, *Graphites*, *Calcareo*, *Arsenicum iodatum*, *Kali muriaticum*, *Thuja*, *Sulphur* and *Potassium* will probably be required. In most cases the well-selected single remedy repeated at intervals over a considerable period of time will clear up a case if proper diet and hygiene be observed.

In special cases it may be necessary to soften unusually hard crusts, for which purpose lanolin or carbolated vaseline may be needed. Boracic acid lotions, carbolic acid water and the various preparations of zinc and lead have been used, but as a rule these are objectionable, and the freer the eruption can be kept from lotions and salves the more prompt will be the recovery of the case.

CHAPTER LXXXVIII.

PEMPHIGUS.

General Considerations—Symptoms and Course—Etiology—Pathology—Diagnosis—Treatment.

General Considerations.—Pemphigus is an acute or chronic disease that is exceedingly rare and characterized by the formation of irregular, scattered and successive crops of various-sized bitches. There are two varieties generally described, the pemphigus vulgaris and pemphigus foliaceus.

Symptoms and Course.—Pemphigus vulgaris occurs without pronounced symptoms or general systemic disturbances as a

rule. Irregularly scattered blebs form, few in number, varying in size from a pea to a large egg, with a base of erythema, or coming up on apparently normal skin. They are round or oval-shaped, usually distended and contain at first a clear fluid which gradually becomes turbid, even purulent. Each lesion is separate and distinct, and runs its course in from several days to a week or more, the fluid contents usually disappearing by absorption, though in rare cases spontaneous rupture occurs, leaving the rete exposed. Unless rupture takes place the blebs desiccate, leaving a thin, dry crust, and as the crust falls the site of the pemphigus is somewhat excoriated and more or less discoloration is left to mark the lesion. The symptoms occurring during the course of pemphigus consist of heat, tenderness, burning and itching, and vary greatly, in some cases being so slight as to be insignificant, in others causing no little inconvenience.

The inflammation occurs upon any part of the body, but is more frequently observed upon the face, next upon the limbs, then the trunk. The mucous membranes of the respiratory and digestive tracts are also subject to its exhibition, though typical pemphigus of these tissues is a rare affection. The course of the ailment may continue over a period of weeks or months, characterized by the development of successive crops of bullae.

Etiology.—The causes of this peculiar skin ailment are not definitely understood. It is more commonly seen in adult life, though occasionally observed in children. In the former it belongs to general debility, overwork, severe shock, nervous exhaustion and other constitutional states. It is not contagious, nor is it believed to be in any sense dependent upon syphilis. It is not at all a common ailment in this country, though it is sometimes seen, especially in Latin quarters of the large cities and among debilitated and anemic children who are reared in unsanitary surroundings and on unwholesome food.

Pathology.—The lesions of pemphigus are superficial, consisting of round-celled infiltration and dilated blood vessels about the corium, papillae and in the subcutaneous tissues. The site of the lesion is beneath the horny layer and the upper part of the rete. The contents of the bleb may be serous or contain blood corpuscles, pus, epithelial corpuscles, fat-acid crystals and occasionally crystals of uric acid. The fluid is always alkaline in reaction and is often found to contain free ammonia.

Pemphigus foliaceus is a much more rare affection than vulgaris and is a graver type of the disease. The blebs are loose and flaccid, their contents become cloudy or puriform almost from the start, and because of their flaccidity the contents are discharged by the rupturing and drying of the flaccid tissues, this forming a crust, underneath which is disclosed the corium very much reddened. New blebs appear on the old sites or lap over on adjoin-

ing and apparently healthy skin, thus extending until the whole surface becomes involved, this even lasting throughout a period of years, seriously affecting the general health, eventually proving fatal through extensive exfoliating dermatitis.

Diagnosis.—Pemphigus is to be diagnosed from herpes, the bullous variety of syphilis, contagious impetigo and herpetic dermatitis. Bullae similar to those of pemphigus are observed in erythema, erysipelas and as the result of traumatism. In rare cases, also, blebs similar to those of this disease are witnessed in scabies, syphilis and urticaria. From herpes iris pemphigus will be diagnosed by the more acute course, smaller lesions, concentric arrangement and variegated colors of that type of herpes. From the bullous syphiloderma it will be distinguished by the previous history of syphilis and the thick, bulky, greenish crusts of the syphilitic skin ailment. Impetigo contagiosa has its own specific history, crusts and distributions, and the very contagiousness of the ailment is sufficient to determine its character. Herpetic varieties of dermatitis form in groups, their lesions are smaller than those of pemphigus, that ailment is characterized by intense itching, and the multiform character of the eruption and the disposition to change type frequently will distinguish herpetic dermatitis from pemphigus.

The duration of the latter is uncertain. Recovery occurs in mild cases even after months or years of persistence. In children and young subjects in the more acute forms not over severe a favorable termination may be looked for. In the most malignant types in subjects whose systems are debilitated and whose general health is very much broken down, pemphigus becomes a truly serious ailment.

Treatment.—The best treatment of pemphigus comprises a combination of local and constitutional measures. The food must be of the most nourishing varieties and the hygienic surroundings of the patient of the very best, if the very best results are to be obtained. Occurring more often in squalid homes and in unsanitary portions of crowded cities the first step towards its cure must be improvement in the local sanitation and hygiene of its subject and his skin. The next most important factor will be the institution of profound constitutional treatment that will so affect the vital forces as to prompt systemic reaction and improvement in the general health. In old school treatment arsenic and quinine with an occasional exhibition of iron forms the basis of treatment, arsenic being especially relied upon. In homeopathic treatment *Arsenicum*, *Iodum*, *Sulphur*, *Graphites*, *Phosphorus*, *Ranunculus bulbosus*, *Rhus tox.*, and *Anacardium* are to be considered.

Arsenicum generally best meets the constitutional state as a rule. Its characteristic symptoms need not be repeated here. The child is debilitated, anemic and feeble and its skin unhealthy.

Anacardium has great burning of the skin, with scarlet redness of the whole body and formation of blisters from the size of a pin head up to that of a pea.

Rhus tox. has confluent blisters containing a milky or watery fluid with exfoliations of the skin.

Ranunculus will be indicated in constantly recurring pemphigus which secretes an offensive, giney matter, forming crusts and healing from the centre. It will be especially required in pemphigus in new-born children.

Caulicaria has large vesicles on the back with extreme anguish in the chest and high fever.

Chininum sulphuricum cures erythema which forms in confluent vesicles and bullæ which ulcerate and dry into crusts.

Cantharis applies to erysipelatous inflammation of the skin with large blisters. There are burning and itching pains, with excessive sensitiveness of the entire skin and great weakness of the patient.

Phosphorus will be required when the blisters are tense and painful; when they are full and distended they pain less.

External applications may be required in individual cases, depending upon the degree of irritation, inflammation and ulceration of the skin that is present. These should be bland and unirritating in every instance, being directed more to the relief of the local irritation than to the possible cure of the case by means of local treatment.

CHAPTER LXXXIX.

PSORIASIS.

General Considerations—Etiology—Diagnosis—Treatment—Medication.

General Considerations.—Psoriasis is a chronic inflammatory affection of the skin, characterized by the appearance of dry, reddish and variously-sized, rounded, sharply defined and more or less infiltrated, scaly patches that are white in appearance. The eruption is seen more commonly upon the extensor surfaces, particularly in the neighborhood of the elbows and knees. It is a disease of youth and early adult life, not often seen before the tenth year, but quite common in the second decade. Besides occurring at the sites named it may appear upon the anterior surface of the thighs, buttocks, loins, over the chest, the outer surface of the arms, and is also commonly seen upon the hairy scalp. The eruption is symmetrical, varying in size from innumerable pin-head spots to plaques as large as a silver dollar, even as large as the palm of the hand in older subjects. Its lesions are sharply

defined, standing away from the sound skin as reddish, slightly elevated and infiltrated spots, more or less abundantly covered with pearly-colored scales. These patches begin as pin-points or of pin-head size, are hyperemic, slightly elevated, increase slowly but gradually, in the course of several weeks reaching the size of a dime or larger. After attaining a certain magnitude they may go through a process of evolution and disappear. In other cases they continue to grow slowly until they have covered an area of two or three or more square inches. The eruption is always dry and the course of the disease is always chronic. It is more commonly seen in winter. In individual subjects it disappears entirely during the summer season. The general system undergoes no disturbance that is observable, nor is psoriasis attended by intolerable itching, though there may be a considerable degree of discomfort experienced, especially in susceptible subjects.

Etiology.—The cause of psoriasis is not clear. It seems to be engrafted upon the gouty and rheumatic diathesis, and is observed with sufficient frequency in families to raise the suggestion of heredity. It is not communicable from one person to another—non-contagious—is occasionally seen following upon scarlet fever, varicella and varcinia, and is thought by some observers to be a vaso-motor neurosis. It is a common disease and observed in all walks of life. By some authors it is thought to be due to specific micro-organisms as yet unlocated.

Diagnosis.—Psoriasis is sometimes confused with squamous eczema and the papular squamous syphiloderm. Occurring upon the scalp it has to be differentiated from seborrhea. By careless observers it might easily be confused with ring-worm. From eczema it is to be diagnosed by its sharply-defined, circumscribed, scattered and scaly patches. From the squamous syphilide, whose scales are usually dirty gray in color, with patches of a coppery hue, whose eruptions are more commonly seen upon the palms of the hands, soles of the feet and the face, it will be differentiated by the fact that its eruption appears on the outer surface of the body, especially the thighs, buttocks, and outer surface of the arms, as well as at the bends of the knees and elbows. Besides, the papular squamous syphiloderm has a previous history of syphilis and the constitutional symptoms of sore throat, mucous patches, rheumatoid pains, alopecia, syphilitic teeth, syphilitic nodes and other symptoms peculiar to that disease. The scales of the squamous syphilide are dirtier looking and more adherent than those of psoriasis, and the skin at the site of a syphilitic patch is much more infiltrated; it differs from ring-worm in that the latter clears up in the centre, the area of inflammation being at the outer margin, in individual cases spreading considerable distances, with healthy integument occupying the entire central portion of the ringworm patch.

Treatment.—Psoriasis is one of the skin diseases that is exceedingly difficult to eradicate; while in individual cases taken early it responds promptly to medication yet in most cases the tendency is to drag along over a long period of time uncured. The general health of the subject must be taken into consideration, his environments improved, his diet be most wholesome and nourishing in character, and if he be anemic and debilitated he should be fortified by general constitutional tonics and supportive remedies.

Locally, lotions of carbolic acid, tar lotions and ichthyol have been found helpful. Chrysarobin painted over the affected area every third or fourth day has been found locally curative in contained cases of older subjects. In children it causes too much irritation of the skin, and if used at all must be used with great caution.

Tar is perhaps the best of all external applications. It is slow in its action, but is non-irritating. It may be employed in full strength, or weakened with lanolin or petroleum. The oil of cade or oil of birch may also be found useful, being thoroughly rubbed into the diseased patch once or twice a day. Applications of mercury, pyrogalic acid, naphthol and resorcin have also been extolled, but as a rule a simpleunction for the purpose of allaying what little irritation exists and assisting in the process of removing the scales will be all that will be required externally.

The disease is one of the papillae of the corium and not being attended by very much irritation is not apt to require soothing lotions; yet external applications to be effective should be thoroughly rubbed into the corium.

MEDICATION.—Remedies that will be found especially beneficial are *Arsenicum*, *Arsenicum iodatum*, *Sepia*, *Sulphur*, *Calcarea*, *Kali arsenicosum* and *Thuja*. The latter remedy has served the author to excellent purpose in two cases, presumably sycotic. This ailment is not apt to make itself manifest by the exhibition of special characteristic symptoms, and the treatment will as a rule be based upon the constitutional make-up of the child.

Arsenicum iodatum has persistent itching, burning and marked infiltration of the skin. The skin is swollen and brawny, the central portion of the spot standing out more prominently than the areas that are whitish, even pearl-like in color.

Thuja covers the sycotic child with unhealthy skin; considerable furfuraceous scaling with nodules of infiltration at the margin of the patch.

Natrum arsenicosum has dry rough skin, with patches slightly reddened and covered with scales. The patient is debilitated and is intensely sensitive to the action of cold.

Rhus tox. is helpful in cases attended by much itching, with nightly aggravations, nightly aching and a sore sensitiveness of the affected area.

Silicia will be required if the skin is generally dry and brittle, and if in the subject of psoriasis the nails are thick and horny, with onychia forming at their roots.

Petroleum is especially applicable in psoriasis of the hands and scalp, and in large, scaly patches over the posterior surface of the arms and back. The skin is sensitive to touch and the itching is aggravated in cool air.

Colchicum, *Rhus tox.*, *Manganum* and *Sulphur* will be required in subjects who are especially rheumatic and in whom the skin symptoms are worse in raw weather.

Calcarea carbonica, *Graphites*, *Natrum sulphuricum* and *Sulphur* will be thought of in connection with children possessing the respective constitutional states of these remedies.

Phosphorus and *Arsenicum* are perhaps the basic remedies in most cases, especially the latter remedy in relation with iodine. *Calcarea iodatum* and *Baryta iodata* are also to be thought of in the treatment of psoriasis in glandular subjects.

The skin should be kept in as healthy a condition as possible by frequent bathings, during which either tar soap or carbolic soap is used, unless bathing is objectionable to the child, in which event *Sulphur* may be exhibited to advantage. Soap impregnated with sulphur may also be employed.

CHAPTER XC.

URTICARIA.

General Considerations—Etiology—Symptoms and Course—Treatment.

General Considerations.—Urticaria or nettle rash is an acute inflammatory disease characterized by the sudden development of whitish, pinkish, reddish elevations or wheals, also called pomphi, that come out suddenly upon the skin, retaining their form for a few minutes, several hours or more, and attended by severe itching, stinging and burning sensations. In very young children urticaria bears the name of "hives," in which form it appears as single spots, varying in size from a pea to the diameter of the finger nail or larger. They are round or oval in shape, but in older children or adults assume different shapes, sometimes appearing as great wheals upon the skin, standing up some distance from the level of the surrounding integument. If the skin be vigorously rubbed or scratched at the time an urticarious rash is developing it will come out better wherever the rubbing or scratching is done. The wheals are generally somewhat elevated

above the surrounding surface, are possessed of the brawny feel, are usually white in the center and reddish or pinkish at the periphery.

Etiology.—Urticaria appears most commonly in association with gastric derangements, especially from particular kinds of food that are indigestible and offensive to the individual system subject to urticaria. The disease is seen in rheumatic and nervous subjects upon the use of vinegar or other acids, and seems to be caused in still others by the use of shell-fish. In individual instances it occurs in connection with congestion of the liver that is followed by a mild degree of jaundice. Strawberries are the cause of urticaria in some children, while in others rich food and pastries serve to excite it. The cause may be of central origin or reflex in character, the wheals being the result of the action of the vaso-motor system, resulting from spasmodic contraction of the capillaries. As this passes off reaction ensues and serous effusion follows, it being the presence of effused liquids in the integument that causes the appearance thereupon of the individual wheals of pronounced urticaria.

Symptoms and Course.—There may be more or less premonitory gastric derangement and general malaise, even acute nausea and vomiting, with sharp pain in the region of the liver, and, in rare cases, diarrhea, prior to the development of the eruption. In other cases the first symptom to present is a sense of smarting and burning at some particular point, exciting scratching and rubbing with the result that there quickly follows considerable-sized elevations of the integument, white in appearance and brawny to the touch, appearing there as individual spots varying in area from the size of a pea up to a silver half dollar, or occurring in wheals several inches in length and from a quarter of an inch to an inch or more in width. These remain upon the skin a few minutes or an hour or more, the effusion being quickly absorbed, the urticarious eruption disappearing completely, perhaps to return elsewhere upon rubbing or scratching. The wheals bite, burn, sting and itch acutely. In some cases they appear as papules, while in others they are large and node-like, in which case they are denominated *urticaria tuberosa*. In the bullous type the inflammatory action has been sufficiently extensive to cause an exudation of blood in the affected area, with the result that blebs form. In the papulous variety the lesions partake of the nature of small papules. It is this type that is denominated "hives," and that is seen particularly in very young and badly nourished children.

Except in young babies urticaria is a simple ailment that results in spontaneous recovery, rarely re-occurring and lasting but a few hours. In impoverished children, those feeble at birth and who are subjects of constitutional dyscrasia, in whom hives

appear, more or less of danger attends upon this ailment; not because of its own pathological lesion but because the condition of the blood that results in its development may lead to suppression and metastasis to other tissues, as the mucous membranes or the lungs or cerebral meninges. Urticaria may, therefore be indirectly responsible for a fatal issue in very young and ill-nourished children; even in older subjects it may develop upon the mucous membranes as upon the skin, and in very young children in whom the mucous membranes are more affected acute bronchitis, even pneumonia, may be the result of suppression of hives, while in still other cases, as suggested before, metastasis occurs through the meninges, when death may ensue from convulsions.

Treatment.—The treatment of urticaria is simple. *Acemite* may be demanded when the patient is hot and feverish, with thirst, restlessness and a great deal of itching and burning about individual spots.

Pulsatilla will best meet the hives of gastric origin, with nausea and vomiting, or urticaria with diarrhoea. The development of the eruption upon the skin, or its suppression, is attended by sharply defined chilliness.

Antimonium crudum is also a useful remedy for urticaria with intense gastric catarrh; urticaria caused by the use of acids, and aggravated by heat.

Nux vomica will meet urticaria from the use of rich foods, the wheals appearing over the region of the stomach and liver, the skin being quite jaundiced as the rash passes off.

Urtica urens is especially applicable when there is intense, intolerable, fiery itching of the skin. The patient finds it impossible to keep from rubbing and scratching over the affected areas. Face becomes blotched, swollen and disfigured from large urticariform wheals.

Cantharis is very like *Urtica urens* except that the wheals burn more than they itch, and the acid state of the blood is so pronounced that there are strangury and other vesical symptoms in connection with the eruption upon the skin.

Dulcamara will be found beneficial in the suppression of hives from cold, damp weather. The child is blue and catarrhal. When the nettle rash disappears it has violent attacks of coughing, even oedema of the larynx. The eruption is white, irregularly blotched, raised above the level of the skin. Intense itching and burning after scratching. Urticaria from gastric disturbance with nausea, bitter taste, vomiting, and intense aching at the pit of the stomach. As will be seen from this array of symptoms *Dulcamara* is one of the best remedies in nettle-rash.

Ascaris is almost a specific for urticaria from eating shell-fish. The wheals itch and burn intensely. The child is restless

and disturbed from this trouble. *Artemisia* is useful also for crops arising from suppression of nettle-rash.

Calomel is applicable to re-occurring nettle-rash which disappears in the open air but is worse in a warm room. Elevated urticarious spots on the shin and legs from scratching.

Besides these remedies *Rhus tox.*, *Sepia*, *Natrum muriaticum*, *Ascaridium*, *Bovista*, *Hydrastis*, *Apis* and *Sulphur* will be required in special cases.

Local medication is not usually necessary. In specially intense cases with severe itching and burning, a soda bath, salt bath or carbolic acid bath, and the application of very weak dilution of the selected internal remedy, especially *Cantharis* or *Urtica urens*, may be found helpful for the relief of the burning. In very young children in whom hives are repressed and constitutional symptoms appear, especially if convulsions threaten, *Gelsemium*, *Veratrum viride*, *Belladonna*, *Rhus tox.* or *Helleborus*, together with the hot pack, may be required for the development of the rash upon the skin.

CHAPTER XCI.

IMPETIGO.

General Considerations—Etiology—Symptoms and Course—Treatment—Medication.

General Considerations.—Impetigo occurs in two forms, Impetigo simplex and Impetigo contagiosa. It is an acute inflammatory disease, showing by the formation of vesicles, pustules, or bullæ, the size of a pea, rounded, elevated, and more or less firm and discrete. The contagious variety differs from the simple form in the fact that its vesicles or blebs are larger, becoming vesiculo-pustular and turning to thick yellow crusts. These lesions are often umbilicated and if close together tend to coalesce, drying in the course of a few days or a week.

Etiology.—The cause of impetigo is not understood. It is a contagious disease, except in the simplest variety, the contagion of its lesions being inoculable and auto-inoculable. It is seen more commonly in young children, and is doubtless due to the presence of a specific micro-organism. The contents of the simple variety are composed of pus corpuscles, a few red blood corpuscles, epithelial cells and cellular debris. The contagious type presents about the same characteristics, and it is believed by some observers that impetigo simplex and impetigo contagiosa are but one and the same ailment. The pronounced type presents as an epidemic in exceptional instances.

Symptoms and Course.—Impetigo is preceded by slight symptoms of malaise, these being followed by the development of its individual lesions on the face, hands, feet and lower extremities, the eruption beginning as pustules, which are elevated, semi-globular or rounded, varying in size when mature from the size of a pea to the size of a silver half-dime or larger. The face and fingers are the most common site of the eruption. The pustules increase in size by extending peripherally. They are more or less flattened, and as they fill with fluid they become umbilicated. There is at first a hard, inflammatory areola which disappears as the pustule matures. If these are located close together they coalesce, forming a large patch. The course of the ailment lasts from a week to ten days, by which time all of the lesions leave, drying as thick crusts of a light yellow color. These drop off as they dry, leaving reddish spots which gradually fade away. The disease tends to spontaneous recovery in from one to two weeks, though in exceptional cases where itching is pronounced individual sores may form at the site of the impetigo pustule, these remaining a number of weeks.

Treatment.—The treatment will consist chiefly in the prevention of the spread of the disease and the prompt removal of the crusts as they dry. This is best effected by means of warm water and soap washing of the affected parts, either tar or carbolic acid soap being used by preference. Local applications to the itching skin, as boracic acid solution, carbolic solution, graphites, calcinated vaseline, or other simple unction is permissible. The application of lead ointment with camphor, or of beta-naphthol, or the oil of eucalyptus has been recommended and used with varying success; but it is not believed to be necessary to resort to ointments of this character, the simple unctuous being quite as useful and being less likely to induce constitutional symptoms by metastasis.

Medication.—For the simple type of impetigo it will not be necessary to go beyond *Arsenicum*, *Calcareo carbonica*, *Graphites*, *Lycopodium*, and *Sulphur*. For the more pronounced form of impetigo contagiosa *Arsenicum*, *Hepar*, *Mercurius*, *Rhus tox.*, *Sepia*, *Sulphur*, *Silicia*, *Natrum muraticum*, *Tauja* and other remedies may be required.

Arsenicum is applicable when the pustules are dark and fetid. Those on the face and scalp are painful, worse from cold and touch and better from warmth.

Calcareo carbonica will be found beneficial during dentition. The crusts are dry and those in the hair and at the roots of the hair are sensitive. There is the characteristic *Calcareo* perspiration about the forehead and neck and the child is lymphatic in temperament.

Graphites will be required for scabby eruptions with extensive oozings. The eruption forms more particularly about the

mouth and nose; there may be corrosive blisters about the extremities and fingers. The skin is dry and very sensitive to cold.

Thyia has eruption all over the body. Pustular eruption about the knees. Itching of eruption relieved by gentle rubbing. Itching and shooting pains in the impetiginous sores, worse at night.

Hepar is applicable especially to impetigo that is sensitive to touch. Humid crusts form upon pustules that exude a fetid substance, those forming especially upon the head and behind the ears, the cervical glands being swollen and tender. Pustules form on the hands, which are dry and cracked.

Rhus *tox.* has small pustules on a black base; humid eruption on face and head emitting a fetid odor.

Mercurius is applicable to impetigo with suppuration of the skin. Moist crusts form with excoriation of the scalp and head. Yellowish crusts form on the face, especially about the mouth.

Sulphur has dry, thick, yellowish crusts on the scalp, with purulent eruption on the elbows and about the joints.

Clematis has pimples on the forehead, root and sides of the nose, in subjects of psoric constitution; pustules about the lips, that are tender to touch.

Baryta carbonica is applicable to impetigo in fat, sluggish children with swollen lymphatics and soreness and swelling of the throat. The *Baryta* child feels better in the open air.

CHAPTER XCII.

HERPES.

General Considerations—Herpes Simplex—Etiology—Diagnosis—Treatment—Medication—Herpes Zoster—Etiology—Symptoms and Course—Pathology—Treatment—Herpes Circinatus—Etiology—Pathology—Diagnosis—Treatment—Medication.

General Considerations.—Herpes is an acute, non-contagious, inflammatory affection of the skin characterized by the development of single vesicles or clusters of vesicles located upon a somewhat reddened base, arranged in groups and occurring more commonly about the face and genitalia, though special forms are seen elsewhere. The vesicles are from the size of a pin head up to that of a small pea. When occurring about the lips and face they may coalesce and seem to be much larger.

Herpes occurs in different types, as herpes simplex, herpes zoster, herpes iris and herpes gestationis, the latter type belonging to pregnancy and having nothing to do with the disease as

it is seen in children. Herpes is also divided clinically into various classifications, depending upon its location, as herpes facialis, herpes frontalis, herpes ophthalmitis, herpes progentialis, etc. Clinically it is divided into two more commonly observed forms, namely, herpes simplex and herpes zoster.

Herpes Simplex.—This ailment is more commonly known as herpes facialis, as it is most frequently seen upon the face, especially about the lips. It is the common fever blister or cold sore, and appears as an acute inflammatory disorder, characterized by an eruption of vesicles with reddened bases, or vesicles appearing abruptly, being generally preceded by malaise and slight fever, though it occasionally occurs without precursory symptoms. There is often experienced a slight feeling of burning and heat in parts upon which vesicles appear prior to their development. In this simple type the vesicles are pin-head in size or somewhat larger, are usually hyperemic and form in clusters. At first the contents are usually clear but subsequently they become more or less opaque or puriform. The tissue upon which they are located becomes infiltrated and swollen, and in the severest cases, especially if the lips be the site of the disorder, the child's face may be very much disfigured by the degree of swelling of the lips and adjacent structures.

The course of this simple type of herpes lasts over a few days, sometimes occupying a week or ten days. The vesicles, at first opaque and subsequently puriform, as stated, dry into light brown crusts which exfoliate, leaving a tender, exposed surface, but no destruction of cuticle. Generally there are but one or two clusters or groups of herpes simplex, and in exceptionally mild cases a single blister or two will form. When seen about the lips the ailment is denominated herpes labialis; when spread over the face it bears the name of herpes facialis. If occurring especially upon the forehead, as it sometimes does, it is denominated herpes frontalis.

ETIOLOGY.—Simple herpes is very often seen in connection with malarial fevers and other febrile disturbances. It occurs also in connection with digestive disorders, is more commonly observed at some stage during the course of acute lung disease, especially pneumonia, and in the female sex, especially in young girls, is often seen at the monthly menses. During the winter season and early spring it is not uncommon for children to suffer no little inconvenience from large cold-sores on the lips and face, and in those predisposed to skin eruption, the degree of disfigurement at this time is considerable, great yellow crusts covering considerable areas of integumentary surface about the lips and mouth.

DIAGNOSIS.—The diagnosis of herpes simplex is easy. The presence of individual vesicles or groups of vesicles about the angles of the mouth, the lips, forehead or face is not likely to be mistaken for other skin eruptions, especially since there is usually a

History of cold or fever. The presence of hydroa during the course of pneumonia or acute malarial fever is accounted a favorable symptom, and the appearance of herpes labialis during the course of either one of these diseases is a diagnostic point of some value. If occurring about the genitalia it may be necessary to differentiate herpes from chancre. The disease occurs more commonly in the female sex than in the male and appears as herpes progenitalis upon the labia majora and minora. In unusually severe cases these tissues become swollen, the herpetic vesicles coalesce, and considerable itching, burning and pain are experienced by the patient. The eruption at this site is more common in young subjects than during adult life, and it is more likely to be located upon the integumentary surfaces than upon the mucous surface. Chancre, on the other hand, is more commonly seen upon the mucous tissues and results in ulcerative destruction of the membrane, whereas herpes destroys no tissue.

TREATMENT.—The simpler types of herpes will require but little in the way of external treatment, other than simple cleanliness. Application of cold cream, calendulated vaseline, lanoline, medicated or plain, or other simple unction to soften the crusts and assist in their easier removal is all that is required, unless it be that it may be desirable to bathe the pudenda, when this part of the system is affected, with tar soap suds or weak carbolic lotion. As a rule it is not best to indulge in frequent bathing of the inflamed integument, yet in herpes progenitalis it is highly essential that the genitalia shall be kept thoroughly clean and dry.

MEDICATION.—Occurring as simple cold sores herpes simplex will not require other remedies than *Acute*, *Ferrum phosphoricum* and *Belladonna* as a rule. Occurring during the course of pneumonia the treatment will be directed toward the severer disease and the general symptoms of the patient. *Natrum muriaticum*, *Rhus tox.*, *Apis*, *Cantharis*, *Baptisia*, and perhaps other remedies may be required.

In the course of malarial fevers *Natrum muriaticum*, *China*, *Arsenicum*, *Pulsatilla*, *Lachesis*, *Cedron*, *Mercurius* and possibly one or two other remedies will be all that will have to be studied in this connection.

The herpes of typhoid fever will require *Rhus tox.*, *Baptisia*, *Dryonia*, *Kali phosphoricum* and similar remedies.

Herpes progenitalis is more likely to need *Mercurius*, *Thuja*, *Kali muriaticum*, *Graphites* and *Natrum sulphuricum*.

Herpes Zoster.—Herpes zoster, zona, or shingles, is an acute inflammatory affection presenting lesions similar to those already described, with the vesicles arranged in groups along the course of or near cutaneous nerves, usually affecting but one-half of the body. The eruption occurs most commonly along the course of the intercostal nerves around the trunk; but it may also appear

in other portions of the system, as on the forehead, scalp, back of the neck, about the eyes and elsewhere.

ETIOLOGY.—Herpes zoster is very common among children and young people. It is observed more frequently during the spring of the year, occurs with about equal frequency in both sexes, and is accounted by some authors as among the acute infectious diseases of childhood. It seems to be traceable to an inflamed and irritable state of either the spinal ganglia, nerve trunks or peripheral branches of certain of the spinal nerves, and is attributed to an inflammation or irritation of these tissues from atmospheric changes, cold, injuries, and irritations as yet not understood.

SYMPTOMS AND COURSE.—Herpes zoster is usually preceded by sharp neuralgic pain, though this may come on during the development of the eruption. In special instances the pain is so severe as to be accounted an attack of pleurodynia or gastralgia. When occurring in the right side and chest wall it has been ascribed to congestion of the liver prior to the development of the eruption. In some cases nausea, headache, vomiting, and a considerable degree of fever precedes or attends on appearance of the rash. The affected area is usually exquisitely sensitive to touch and very painful upon motion. The pain is of a sharp, lancinating character, or may consist more of a smarting, burning, itching sensation with moderate pain. The eruption first appears as a patch or patches of reddened skin in the immediate neighborhood of the pain. The skin becomes hyperemic, or inflammatory, and either quickly develops one or more groups of red papules, these vesiculating or forming into vesicular papules, occurring in irregularly shaped groups. I have observed cases of shingles in which there would be an inflamed area several inches in length and but two or three inches in width, extending from the sternum along the course of the intercostal nerves to the spinal column on one side. In adults I have seen this zone of inflammation completely encircle the body, the patient suffering intense pain and very profound constitutional symptoms, these usually being in proportion to the degree of herpes that appears upon the surface. If the eruption is slow in developing the pain is very likely to be severe, and if it be aborted or suppressed there is much more likelihood for nausea, vomiting, headache, and high fever.

The lesions of herpes zoster vary in size from that of a pin head to a split pea. They occur in successive groups, the skin is at first bright red and inflamed, and subsequently covered with vesicles that stand out distinctly from the skin, usually discrete, forming thin, yellowish or brownish crusts, which soon dry and drop off. It requires three or four days for each group of vesicles to go through the stage of formation and maturation, their liquid contents becoming purulent prior to the development of the crusts.

the whole course of a successive group of vesicles covering from eight to fourteen days. In milder cases no disfigurement is left, while in severe cases there is discoloration at the site of the eruption for some weeks. If shingles occur in a region plentifully supplied with lymphatics there is likely to be enlargement of the lymphatic glands, especially the axillary glands. If it occur over heavy muscles these are subject to clonic spasms. In severe instances local paralysis has been seen to follow suppressed zoster in the more malignant types when fully developed. If the subject be already in ill health, with debility of the general system and a tendency to nose bleed and petechia, the contents of vesicles may become hemorrhagic, in which event the crusts are dark and brownish and are more likely to leave pits as they fall off.

Acute herpes, as herpes zoster also is known, runs its course in one or two weeks, although it may drag out over three or four weeks' time. It attacks almost any portion of the body, but is more commonly seen in the pleural region or upon the shoulders, back, abdomen and upper portion of the thighs. It is usually limited to one-half of the body, more commonly the right side. Violent neuralgic pain preceding and attending the eruption is a very common symptom of shingles in adults and is more pronounced with advanced years. The disease is not likely to be so painful in children. It rarely attacks an individual but once during a lifetime, though it seems at times to appear as an epidemic. A succession of cases will occur among children attending school and in orphan asylums and large families within a brief period of time. The more pronounced the febrile symptoms and the more acute the manifestation of the eruption the more likely is it to appear in epidemic form.

PATHOLOGY.—Herpes zoster is thought to be due to an irritation or inflammation of the sensitive nerves or ganglia, the Casserian or spinal ganglia being especially affected. Fatal cases have occurred in which the Casserian ganglion has been found softened, with inflammatory changes along the course of the nerves entering the ganglion. Bacilli and diplococci have been observed in the blood vessels of the ganglion and leptothrix-like cells have been seen within the anterior sheaths of the ganglion. The vesicles are developed in the rete, the papillae are enlarged, and the blood vessels dilate and infiltrate with new cells extending into the corium and subcutaneous tissue. The peripheral nerves at the site of the inflammation are always found to be affected with inflammatory changes, and the neurilemma are filled with cell infiltration. In no other way can the severe pain that precedes and attends upon the development of shingles in adults be explained than upon the hypothesis of nerve inflammation. In exceptionally severe cases this pain is so severe as to completely prostrate the patient.

TREATMENT.—Herpes is usually seen in persons of broken down constitution, those recently recovering from severe sickness, and in children possessed of constitutional cachexia that render them less resistant to the incursions of disease; consequently constitutional and supportive treatment are required if the best results would be obtained. For the severe pain that precedes the eruption *Bryonia*, *Cantharis*, *Capraea*, *Aconite*, *Magnesia phosphorica*, *Ferrum phosphoricum* and *Sulphur* will be required. For shingles occurring about the chest *Aconite*, and *Bryonia* will perhaps be most serviceable. If the pain is agonizing in character *Magnesia phosphorica* should not be overlooked. If it be so severe as to cause profound nerve shock with rigors, headache, congestion of the surface of the body and of the feet and hands, with intense headache, congestive in character, *Belladonna* is more likely to be helpful. If the eruption is slow in appearing and the muscles are intensely sore *Arnica* and *Rhus tox.* may be useful. *Hypericum* is also an excellent remedy for severe nerve pains that are experienced in the first stage of zoster.

But the remedy of remedies for zoster is *Arsenicum*. It has intense burning of the blisters, dry and parchment-like skin, nausea and profound prostration of the whole system and confluent eruption.

Dalecarlia will be found beneficial in moist, suppurative herpes that occurs from taking cold and that is worse in wet weather. Thick crusts form over the spots of inflammation over the body.

Iris will be found more useful in herpes following upon gastric derangement, the eruption appearing upon the right side, especially over the region of the liver, with torpid liver, coated tongue and severe headache.

Menstruum is useful in herpes that follows the course of intercostal or supra-orbital nerves; the pain is sharp, lightning-like, sometimes boring in character.

Rhus tox. is helpful in right-sided zoster, with extensive vesiculation and extreme itching, burning and tingling pains. For zoster occurring in rheumatic subjects, in rheumatic weather and in alternation with dysentery *Rhus tox.* will be helpful.

Phosphorus is often the similitum in herpes in pulmonary subjects, especially when occurring in the course of chronic tuberculosis.

Rumex is curative in herpes attended by violent, tearing cough, relieved as the eruption develops. Other remedies that will be found beneficial in especial cases are *Causticum*, *Kreosote*, *Lycopodium*, *Petrulent*, *Ranunculus*.

Herpes Circinatus.—Ring worm, or, more properly, *trichophyton*, is a disease that is due to the presence of a vegetable parasite or trichophyton. It is seen more commonly upon the

scalp and face, especially about the angles of the jaw, although it may occur upon any portion of the system. In adults it is more likely to be observed upon the bearded regions. It appears as one or more small, slightly elevated hyperemic spots that are scaly, sharply defined, and occasionally mixed with vesicular papules or vesicles, particularly at the circumference of the affected area. Commencing as a small red spot the patch spreads in a uniform manner from its circumference, assuming more or less of a ring-like form, hence the name of ringworm. The patches are generally about half an inch to an inch in diameter, though they may be much larger, the entire affected area embracing several square inches. This ailment is more commonly seen in children than adults and is not uncommon to youths. The inner surface of the thighs is a common site for it, its spread at this point being developed by the heat and moisture of the parts. The buttocks are also attacked. In some subjects the area affected becomes inflamed and sore and presents more or less the appearance of true eczema. When seen about the thighs it is termed *tinca circumata cruris*.

Other special types are *circinata unguinum*, in which the nails are involved, these structures becoming soft or brittle, yellowish, opaque and thickened; the *tinca tonsurarum*, or *capitis*, in which the scalp is the site of the ailment; or the *kerion*, in which the deeper structures of the scalp are involved, the tissues being inflammatory, edematous, boggy, even honey-combed.

ETIOLOGY.—Ringworm is unquestionably due to the presence and growth in cutaneous structure of the trichophyton, a vegetable parasite. It is propagated by contagion, occurs in both sexes and at all ages. It is more usually seen in children than in adults, and in those who are debilitated and of feeble constitution than in perfectly healthy subjects. It is not limited to the human family, being communicable to dogs and other lower animals, and also doubtless contracted from them in many instances.

PATHOLOGY.—The natural habitat of the trichophyton on the general surface of the body is in the superficial layer of the epidermis, upon the chin and other bearded and hairy regions, the roots of the hair, the hair follicles and the hair shafts becoming its home. The fungus consists of mycelium and spores, mycelium being found sparingly in epidermic scrapings, while in hairs that are affected the spores and chains of spores predominate, in fact, are almost exclusively seen. The fungus produces more or less irritation of the skin, resulting in desquamation with the formation of patches of erythema and hyperemia, these varying in size and shape. As the stage of congestion passes on to that of inflammation of the skin vesicles and papules form and more or less of exudation occurs. Where the ringworm is favorably located as regards heat and moisture of the tissues the

irritation and itching may be so pronounced as to induce scratching and rubbing of the affected parts, by which is developed a severe eczematous state as a complication of the original disease.

DIAGNOSIS.—The diagnosis of ringworm depends upon the annular, scaly, erythematous character of the lesion, and is not likely to be mistaken for any other disease. When complicated with an eczematous eruption it is sometimes difficult to differentiate it from eczema proper. In the latter disease the skin is hot and painful, there is more exudation and the vesicles, papules and pustules form at all points, while in *tinea circinata* they are seen only in the periphery. In eczema there is not the regularity of form of the eruption that is seen in ring-worm, and in the latter the patch always heals in the centre and spreads out at the periphery, whereas, such is not the case with eczema. From psoriasis it will be differentiated by the more disseminated form of that ailment and the nature of its history. Favus is not very likely to be confused with ringworm, it presenting its peculiar cup-shaped yellow crusts and a characteristic, mousey odor that are never present in ringworm. While at the very commencement ringworm may be confused with either of the eruptions already named, and others, it is not likely as it progresses that it will fail to clear up all points of doubt by assuming its peculiar ring-like form, healing from center to periphery and developing from periphery further out into healthy structure.

TREATMENT.—To be effective the treatment of ringworm will have to be local and constitutional. It may be that it can be best effectually killed out by local applications alone, and it may be, on the other hand, that unusually successful prescribers may eradicate it by the indicated remedy. I have found it an unusually stubborn and intractable disease, requiring both constitutional and external remedies. Locally, the best applications are a ten to fifteen per cent. solution of the hyposulphite of soda; a weak solution of carbolic acid, five to thirty grains to the ounce of water, or the same quantity to the ounce of lanoline, this being thoroughly rubbed into the affected area once or twice daily; a saturated solution of boracic acid, or, better than all, a weak injection of chrysophanic acid. This latter is the most certainly curative agent I have used. It is the acid of the rhubarb plant and excites a destructive inflammation of the affected skin. It should be applied cautiously, and because it stains the clothing and fingers care should be exercised in its application that only the affected skin is treated. The local application of a five per cent. ointment of this acid has destroyed inveterate ringworms in adults. A three per cent. ointment is strong enough for children. If the face be the affected site it will be well to use other and milder parasitocides.

MEDICATION.—The internal exhibition of *Sediv* is especially helpful. The third attenuation of this remedy, extending over a period of time, with the local application of a solution made from the first and second attenuation, has been found beneficial in very young subjects.

Tellurium is a general remedy for ringworm that I have found only occasionally useful, though it is highly recommended by Lilienthal, Wells and other observers for ringworm on any part of the body, with red elevated rings, very distinctly marked, with minute, itching vesicles; vesicles filled with a thin, excoriating fluid, smelling like fish-brine.

Bacopa is applicable in ringworm in children subject to glandular swelling; ringworm occurring on any part of the body excepting the face.

Calcaria carbonica, *Arsenicum iodatum*, *Sulphur*, *Thuja*, *Natrum sulphuricum*, *Hepar sulphur*, *Fluoric acid*, *Silicia* when the nails are involved, and a number of other remedies may be consulted to advantage in the treatment of ringworm.

CHAPTER XCIII.

PITYRIASIS ROSEA.

General Considerations—Etiology—Diagnosis—Pathology—Symptoms and Course—Treatment—Medication.

General Considerations.—Pityriasis rosea is a mild inflammatory disease characterized by the presence of discrete or confluent, pinkish or rose-red, slightly-raised, variously-sized, scaly macules. It is a trivial disorder, usually seated upon the trunk, though occasionally appearing more or less generally over the body.

Its lesions are slightly elevated and generally round, although when a number coalesce the patch may be irregularly outlined in shape. At first of a pale or a bright pink the macules later assume a salmon tint, desquamating in a bean-like, flaky exfoliation of dirty-gray color, more marked at the periphery and never abundant. When at their height the macules are covered by greasy, yellow or yellowish-white scales. The patches at their base are from one-half to three-fourths of an inch in diameter and they usually remain discrete. The skin is but slightly thickened at the site of these lesions, and the itching is never intense; in fact, as a rule it is quite insignificant.

Pityriasis is a self-limited ailment, lasting from one to two weeks and tending to spontaneous recovery. In some cases the whole process extends out over from one to two months.

Etiology.—The cause of pityriasis is not known. It is considered as relating to seborrhea, as of a parasitic origin, and as a mild inflammatory disease closely allied to psoriasis. In England and on the continent it chiefly attacks young children. It is not often seen in this country, though occasionally it occurs in the spring and fall seasons of the year in mild epidemic form. As might be expected it is more commonly observed in children whose skins are unhealthy and whose constitutional states are not of the best.

Diagnosis.—Pityriasis rosea is differentiated from the squamous syphiloderm in the fact that the latter differs in its history, that it is more widely distributed, and that it has associated with it enlargement of the glands, sore throat, mucous patches, rheumatic pains and falling of the hair; whereas, none of these constitutional symptoms are present in the disease under consideration. Psoriasis is more inflammatory than pityriasis, is more apt to be present as a solid mass of eruption, its scales are more profuse and silvery, and the underlying skin has a red and raised look. It also runs a more chronic course than pityriasis. The annular distribution of ringworm, with its number of patches, its inflamed periphery and its trichophyton cause will differentiate *trinea circinata* from pityriasis, which has a wider distribution, an absence of papules, vesicles and pustules, and which is not as yet understood to be dependent upon a specific, discovered parasite.

Pathology.—In mild cases it manifests itself by cell infiltration of the rete and corium, the papillae and the glands of the skin and the hair presenting a perfectly normal appearance. In severer cases Hebra observed a chronic inflammatory infiltration that was pronounced, the cell infiltration being abundant in all the layers of the skin and particularly beneath the epidermis; the papillae were absent and the blood vessels in the sub-epidermal tissue were surrounded with rete cell-infiltration, the sebaceous and sweat glands were also absent and the hairs were scanty, the hair sheaths being infiltrated with cells. The pathological conditions are more pronounced in pityriasis rebra than in the simpler roseaceous variety.

Symptoms and Course.—As the lesions of pityriasis begin to show, and even before their appearance, there will be a sensation of itching and smarting of the skin with burning, biting, prickling sensations occurring intermittently, more especially where the folds of the skin lie in contact. The lesions may crop out gradually or suddenly, the patches coalescing and spreading until in some cases a larger surface is involved. The color is at first light red or pink, gradually becoming darker, finally yellowish. As they mature these macules become dry and scaly, with a tendency to spread in the periphery and heal in the center, much as does ringworm. The primary lesion is surrounded by a

zone of erythema that itches and burns and desquamates in the form of fine, bran-like cells, the macule itself shedding in larger scalings.

There are not usually any constitutional symptoms of importance, except in the more pronounced cases of pityriasis rubra, in which there may be slight fever, headache, anorexia and more or less debility. The acute symptoms begin to subside almost as soon as they appear and in a few days will have disappeared altogether, the eruption pursuing a course of from a few days to a week or two.

Treatment.—The application of mild lotions, as a very weak solution of carbolic acid, boracic acid, thuja, calendula or other selected medicament will suffice to allay the irritation of the skin and prompt early desquamation. The aqueous solution of the sixth solution of cantharis, or the same of urtica urens, serves to allay the itching and irritation of the skin, if this be unusually pronounced.

MEDICATION.—*Aconite*, *Cantharis*, *Apis*, *Belladonna*, *Urtica arvensis* and *Sulphur* are about all that are required in the way of internal medication. These remedies as indicated will allay the irritation and inflammation of the skin. In very young children, if the itching be a very pronounced feature, and the child be made more nervous and irritable thereby, *Chamomilla*, *Coffea*, and *Pulsatilla* may be demanded. If there seems to be a tendency for the eruption to reoccur, or to be slow in responding to measures for its relief, *Thuja*, *Sulphur* or *Psorinum* will probably promptly clear up the case.

CHAPTER XCIV.

PRURIGO.

General Considerations—Etiology—Treatment—Medication.

General Considerations.—Prurigo is a chronic inflammatory disease of the skin, characterized by an eruption of papules that appear as discrete points from the size of a pin-head to that of a pea, that are solid, firmly-seated, somewhat raised above the surrounding integument, and that itch and burn intensely, the skin of the affected area being considerably thickened and roughened. Prurigo seems to be a secondary ailment in infants who are subject to urticaria. Urticarial wheals form upon the skin and are succeeded by papules which seem to be buried within the integument. At first they are a pale red color, or very like the natural skin, but later they become darker in hue. They are more commonly seen upon the shins, though they may appear elsewhere.

The lesions are considerable in number, though discrete and closely-crowded together. The overlying skin is harsh, rough and dry, and itches intensely. The eruption may also appear upon the extensor aspects of the upper limbs and from its irritation excite enlargement of the inguinal glands. As the disease becomes general, over considerable areas of surface, and the patient scratches and rubs it until it is considerably irritated, eczematous symptoms may be added to the prurigo and the patient be made very uncomfortable.

Etiology.—Prurigo is seen more commonly in ill-fed and neglected children, and develops more frequently in the winter season, doubtless because the skin is less active at this time and is less likely to receive its customary bathing. The course of the ailment is essentially chronic, lasting over months or years. It looks a good deal like papular eczema, is not accounted directly contagious, and is much more commonly seen in foreign countries than in the United States, though occasionally observed here, especially in squalid quarters and among the humbler homes of foreign citizens.

Treatment.—Because of the disease's chronicity and the fact that it is commonly found among ill-nourished subjects it will be seen that it is necessary to place the patient upon a supportivediet and constitutional treatment. Anemic children may require cod-liver oil and other carbonifying foods while undergoing treatment, and in every instance the hygiene of the subject and his sanitary surroundings should be improved. Wholesome bathing of the skin with tar soap-suds, weak carbolated lotions, naphthol, and sulphur soap-water will be found helpful. In severe cases the occasional application of *sapo viridis* will be necessary. As the rule the application of ointments is objectionable, though occasionally petrolatum, tar, carbolated vaseline, or other suited unction may be beneficial.

Medication.—Internally *Arsenicum*, either the *album* or *jodatum*, will be found a basic remedy of no mean value.

Sulphur will be required in the thin, scrawny subjects so often attacked, whose skins are unhealthy and in whose systems is recognized a peptic taint.

Thiysa is a hand-maid of *Sulphur* in these conditions, and will more often be applicable when a syctic taint is at the bottom of the trouble.

Kali carbonicum is adapted to the hydrogenoid constitution that is the subject of dry, scaly eruptions, with intense itching.

Graphites will be required if there is a disposition to scurfiness of eruption, developing in the form of thick yellow crusts or individual papules.

Besides these remedies *Lycopodium*, *Phosphorus*, *Ilex* *tox.*, *Mercenium*, *Natrium muriaticum*, *Silicula*, *Conium* and *Natrium sulphuricum* will be required in special cases. In a general way the

treatment of psoriasis to be successful will have to be directed toward the upbuilding of the general health of the subject. It is essentially a chronic and stubborn ailment, usually lasting through life and resisting well directed efforts at its cure.

CHAPTER XCV.

ICHTHYOSIS.

General Consideration—Etiology—Types—Symptoms and Course—Treatment.

General Considerations.—Ichthyosis, or fish-skin disease, is a chronic hypertrophic disease of the skin characterized by unusual dryness and scaliness, with a variable amount of papillary growth, the appearance given to the skin in a well developed case being very like the skin of a fish after the scales have been removed. It is first noticed in infancy or early childhood, the peculiar condition of the skin being most commonly observed upon the extensor surfaces of the arms and legs, especially the elbows and knees. In a good many cases the face and scalp remain free, though in others the features are very much disfigured because of the involvement of the facial integument. It is not uncommon to observe ichthyosis and eczema in the same subject, in which event the appearance is still more repulsive and the sufferings of the patient more pronounced.

Etiology.—Ichthyosis appears to be due to an hereditary influence that is not understood. It is by no means a common disease, is always chronic in character, shows itself first in infancy or early childhood, its anatomical feature being an epidermic hypertrophy with a varying degree of hypertrophy of the papillae, also, the skin becoming dry, harsh, even leathery, with furfuraceous or plate-like scalings therefrom.

Types.—There are two forms of ichthyosis, ichthyosis simplex and ichthyosis hystrix. In the former there are noticed simply a dryness and scaliness of the skin, with small papules, the integument being somewhat thickened and perhaps here and there fissuring. Considerable-sized scales form on the surface, becoming dark in color before they are shed. The hair is often harsh and lustreless and the nails brittle and crumbly. The skin is dry from a lack of oil and moisture and is more irritated and scaly in winter than in summer. Ichthyosis hystrix is but an aggravated condition of the simple form. The skin is rougher, more hypertrophied, the fissures are larger and may be painful, the lesions may be distributed along the course of a nerve, and in its worse places the skin is marked by irregular or diamond-shaped

spinæ, or lines of elevation that rise distinctly as do the lines on the skin of a fish indicating the locations of its scales.

Symptoms and Course.—There are no special symptoms attendant upon ichthyosis excepting the roughness of the skin, its dryness, its tendency to crack, and to become sore at the largest fissures. Its course is essentially chronic, lasting through life. It progresses during the earlier years until it reaches a certain stationary stage from which it varies slightly. If eczema appears as a complication this may develop into an acute inflammatory type, causing the patient so little inconvenience and suffering and adding an annoying complication.

Treatment.—There is but little to be done for true fish-skin disease. If the patient's general health be below par, or if he be the subject of constitutional taint, either psoric, tubercular, syphilitic, scrofulic or rachitic, treatment should be directed toward overcoming the constitutional condition, whatever it may be. For this purpose *Sulphur*, *Thuja*, *Kali carbonicum*, *Calcarea carbonica*, *Psorinum*, *Mezereum*, *Arsenicum iodatum*, *Lycopodium* and other deep-acting constitutional remedies may be required.

For local affections of the skin as fissures, or open sores, *Natrum muraticum*, *Sulphur*, *Graphites*, *Kali muraticum*, *Arnica*, *Thuja*, *Nitric acid*, *Hepar* and *Mercurius* may be found beneficial, as indicated.

For unusual itching and burning of the skin *Arsenicum*, *Rhus tox.*, *Cantharis*, *Mezereum*, *Graphites*, *Natrum sulphuricum*, *Arsenicum* and other remedies may be demanded.

In a general way it will not be necessary to go beyond *Sulphur*, *Thuja* and *Calcarea* for uncomplicated ichthyosis, whereas if eczema or other skin affection develops as a complication these will have to be treated according to their individual character and symptoms.

CHAPTER XCVI.

MOLLUSCUM.

General Considerations—Etiology—Diagnosis—Treatment.

General Considerations.—*Molluscum epitheliale* is a peculiar, rare affection of the skin characterized by the development of pin-head or pea-sized, rounded, semi-globular or flattened pear-like elevations of a whitish or pinkish color. These appear as small tumors, usually translucent or resembling wax. They have a broad base and occasionally show pedunculation. They are more commonly seen upon the face, though they may appear elsewhere.

Usually not more than from one-half dozen to a dozen spots are observed at a time, always separate, and as they mature they flatten and umbelicate. In appearance they are whitish or pinkish and closely resemble pearl-drops or drops of pearl-colored wax. When first formed they are firm, but later become softer and break down. In individual lesions absorption occurs without previous softening.

Etiology.—Molluscum is confined almost exclusively to children. It is a contagious malady, probably due to its own coccidia. The cause is obscure. The disease is seen more among poorer classes of people and is now more commonly believed to be due to parasitic origin. Some observers contend that it is a cutaneous psorospermiosis, while others are of the conviction that the pathological process is a corneous degeneration of the epithelium. There is hypertrophy of the rete, the growth beginning in the hair follicles. Molluscum are rounded or oval fatty-looking bodies, and are considered as aggregated, degenerative epithelium.

Diagnosis.—Molluscum is not apt to be confounded with any other skin disease. The peculiar milky or pearl-like appearance, the size of the lesions, their discrete nature, and the presence of a central orifice that serves as the focal point of flattening, at which umbelication occurs, will differentiate the ailment from other skin eruptions.

Treatment.—The growth is essentially unresponsive to treatment, usually disappearing spontaneously after a few weeks of existence. Individual molluscum had better be incised and their contents pressed out, the bases being touched with carbolic acid, nitrate of silver or other escharotic. If individual tumors are pedunculated these may be ligated with a very fine silk thread. A very effective way of destroying the growth is by galvano-puncture. The ailment seems to be wholly local and not to demand constitutional measures. It will doubtless be beneficial, however, in most cases, to prescribe the proper constitutional remedy, as *Sulphur*, *Thiia*, *Arsenicum*, *Iodum* or other properly selected agent, if treatment be demanded by the child's general condition.

CHAPTER XC VII.

LUPUS VULGARIS.

General Considerations—Etiology—Pathology—Symptoms and Course—
Diagnosis—Prognosis—Treatment—Medication.

General Considerations.—Lupus vulgaris is a tuberculous affection of the skin, characterized by cellular new growth, the eruption consisting of soft, reddish-brown, papular, tubercular and infiltrated patches, located especially upon the face, though also observed upon other portions of the system. It is a disease that is more commonly observed in childhood, though seen also in early adult life. In milder form it consists simply of tuberculous patches of redness about the wings of the nose and cheeks, shaped like the spread wings of a bat, this type being denominated *lupus erythematosus*.

The severer type, known as *lupus vulgaris*, begins by the development of several deep-seated, brownish red or yellowish tubercles, from the size of a pin-head to the size of a small pea, their anatomical seat lying in the deeper part of the corium. From these spots the disease spreads in irregular shape, covering over a considerable area of thin and imperfectly formed epidermis. The aggregations of nodules are rough, and occasionally where they are more dense pustulation and ulceration occur.

The lesions of *lupus* remain stationary for a time when they have attained their full size, but eventually retrogressive changes occur, the papules or tubercles disappearing by absorption from fatty degeneration, leaving raw surfaces, even considerable-sized ulcerations, usually at the margins of the sore. The *lupus ulceration* is rounded, consisting of a shallow excavation with soft and rounded borders. Pus in variable quantity is secreted and from the exudation which occurs more or less of crusty formation gathers along the edges of the ulcer. As healing follows the former site of the ulcer is occupied by dense, fibrous, cicatricial tissue. The disease spreads by the appearance of new papules and tubercular infiltration at the peripheral portion of old *lupus* areas. In rare cases the mucous membranes of the mouth, throat and larynx are involved, though as a rule the disease is confined to the skin.

Etiology.—Lupus vulgaris is, beyond question, tuberculosis of the skin, and due to the invasion of the cutaneous tissues by tubercle bacilli. It is in no wise related to nor dependent upon syphilis as a cause, but is commonly observed in strumous and debilitated children of tuberculous parentage.

Pathology.—The infiltrations of lupus vulgaris are chiefly due to cell proliferation, excessive growth from the protoplasmic cells and the adventitia of the blood vessels and lymphatics of the integument. In the fibrinous tissue net-work new blood vessels and a portion of the cell infiltration are produced, the fixed and wandering connective tissue cells of the inflamed struma of the cutaneous structure being responsible for the remaining portion of the new growth. (Robinson).

Symptoms and Course.—Lupus vulgaris presents a variable course. It usually occurs about the face, nose and cheeks, but is also seen upon the arms, anterior surfaces of the thighs, buttocks, and elsewhere. Its course is not uniform; at times it develops with considerable rapidity and at other times remains quiet for a long period, apparently cured, only to start up again from individual points that are left. The first indications of its presence are the appearance of small, brownish-red spots, slightly raised above the level of the skin, or in some cases depressed below its level. These show a slight area of inflammation surrounding them, coalesce and form patches of a brown-red color, which upon pressure become softened and break down. Tubercles or nodules form in the affected area and at their site sharply defined ulcers occur when disintegration takes place.

Complications arise during the course of lupus that give no little inconvenience. If the disease assumes a most malignant type the wings of the nose, portions of the lips, and other soft structures of the face may be entirely destroyed. The lymph vessels take up the inflammatory process, and the skin becomes thickened in places, neighboring lymph glands becoming enlarged and tender. If the sore be located on the thigh or over other soft structures it is not apt to be painful or very troublesome. There is more or less of itching, soreness and burning, but except for the local inconvenience that is caused by the presence of adhesion of the integument it is not especially annoying.

Diagnosis.—There is but little difficulty in making out a diagnosis of lupus vulgaris, the only condition with which it may be confused being syphilitic gummata, which are very rare in children. The gumma forms much more rapidly than the lupus sore and goes through its various stages more quickly, breaking down into a sharply punched-out ulcer with clean cut borders, a considerable mass of tissue sloughing out within a few days when once disintegration begins. Lupus pursues a variable course, spreading rapidly at times, at other times being quite sluggish, its ravages being limited to the superficial integument, except in most malignant cases where it affects the deeper structures.

Prognosis.—The prognosis of lupus is favorable in all except the most malignant cases in unfavorable subjects. If neglected it may cause such extensive destruction of the soft tissues, especially

about the face, that by extending to the sinuses and lymphatics and setting up general constitutional impairment of health it may lead to a fatal issue. Its course is essentially chronic and it is stubbornly resistant to treatment, though in young subjects a cure often promptly follows the institution of proper local and constitutional measures.

Treatment.—The treatment of lupus implies anti-tuberculous medication, nourishing diet and local surgical measures. The latter consists of the thorough removal of every portion of the diseased skin by means of the knife, scissors and curette. The most satisfactory means for the removal of lupus is the dissection of hypertrophied skin with the knife and scissors and the thorough scraping of the entire area with Volkmann's sharp spoon. If a single vestige of the tuberculous mass is allowed to remain the disease will spread; therefore the removal should be complete.

It has not been found satisfactory to rely upon escharotics for its destruction. The removal of the mass should be accomplished by radical surgical measures under proper antiseptics, the subsequent treatment of the wound being conducted in accordance with strict antiseptic practices.

Medications.—Lupus will require the exhibition of remedies that have been found curative in tuberculous states. *Sulphur*, *Calcareo carbonica*, *Calcareo sulphurica*, *Thuja*, *Phorinum*, *Arsenicum*, *Iodum*, *Silicium*, *Graphites*, *Kreosotum* and similar remedies will be required. For the destructive variety *Nitric acid*, *Mercurius*, *Calotropis*, *Silicium*, *Causticum* and *Kreosotum* will be found most beneficial. For lupus non exedens *Arsenicum iodatum*, *Calcareo*, *Sulphur*, *Silicium* and *Thuja* will probably be demanded.

Lupus patients should have the benefit of fresh air, out-door exercise, change of climate to the sea-shore or mountains as required, or, if the general health be impaired, to the hilly country of Southwest Texas or New Mexico, and should be supported by a liberal, nourishing diet and the occasional exhibition of cod-liver oil, petroleum emulsion and other carbonifying agents, as demanded.

CHAPTER XCVIII.

SYPHILODERMA.

General Considerations—Characteristics—Treatment.

General Considerations.—The skin is subject to the manifestations of syphilis, which assume a number of forms. In a general way the treatment of all of these will have to be constitutional, and should be carried out upon the principles and recommendations embraced in the chapter on Infantile Syphilis.

Syphilis may show itself upon the integument in the form of macular, papule, pustules, bullæ, tubercular and gummatous eruptions, or there may be an admixture of a number of these types in one case. Acute syphiloderma are always attended by constitutional symptoms, as headache, fever, loss of appetite, muscular pains, enlargement of the lymphatic glands, sore throat and other distinguishing symptoms. Destructive syphiloderma, as the tubercular, gummatous and ulcerative types, follow later and present more or less profound constitutional disturbances in every instance.

Characteristics.—Syphilitic lesions are usually of a dull, brownish-red or lean-ham color. In special instances they may assume a yellowish tinge. The erythematous rashes that are most commonly seen about the buttocks and perineum, and at times about the neck and wherever the skin gathers in folds, show as reddish macules, these coalescing into an intertrigo-like eruption that is yellowish-red, shiny and more or less moist. If the macular eruption appears upon the body or upon the palms of the hands and soles of the feet it may be quite red and scaly.

The papular syphiloderma appears as a discrete eruption, although in special cases a number of papules may be grouped together. These may be flat or acuminate. They are of a brownish-red tint, and in special cases are not unlike the milder form of lichen. If they occur near the mouth or anus, or on other portions of the system where they are exposed to irritation, they assume very much the appearance of the mucous patches of acquired syphilis.

The pustular syphiloderma presents in the form of the small acuminated pustules, large acuminated pustules, small flat pustules and larger flat pustules. If the pustular type occurs early it is an indication of severe constitutional affection. This type is seen upon almost any portion of the system, but is most commonly observed upon the buttocks, scrotum, thighs and also upon the face.

The bullous syphiloderma is that type of eruption that is observed in the first few weeks of life and that is nearly always seen upon the palms of the hands and soles of the feet. In severer cases they may spread over the posterior and inner surfaces of the thighs and be found upon the buttocks. They are at first small vesicles or pustules, but grow rapidly to the size of a silver dollar or larger. In some cases they are firm, in others flaccid. In some they are very regular, almost perfectly round in outline, in others they are ovoid or irregular in shape. The bullæ fill with a purulent fluid, and as this is discharged thick crusts form upon an unhealthy ulcerative surface.

Other types of syphilide that are observed are the vesicular, the most papular, papular squamous syphiloderma and tubercular syphiloderma.

It is not possible in a work of this kind to discuss the various types of syphilitic eruptions upon the skin in detail, nor to more than outline their classifications, course, symptoms and treatment. For more extensive knowledge upon this topic the student should consult text books on syphilis.

Treatment.—In a general way the treatment of the various syphilides will have to be directed to the general systemic condition of the patient. Syphilis is syphilis wherever found, and in the regular order of treatment the basic remedies will be found to be the various preparations of *Mercurius*, *Kali*, *Iodum*, *Thuja*, *Nitric Acid*, *Mercerum*, *Kreosotum*, *Arsenicum* and *Sulphur*. The time will have passed for the exhibition of mercury in any form except in combination with iodine when the skin has become affected. Here the various preparations of potassium, as *Kali hydrindicum*, *Kali iodatum* and *Kali sulphuricum*, will be needed. *Arsenicum iodatum*, *Thuja* and *Nitric acid* will also be found to be remedies of value in local syphilis.

Arsenicum iodatum is especially beneficial in cutaneous ulcerations discharging greenish pus that irritates all the tissues with which it comes in contact.

Kali iodatum covers ulcerating papules that leave scars; deep-eating ulcers upon the skin, with swollen, indolent glands.

Kreosotum will be found beneficial in tertiary syphilis of the skin and bones. Painful syphilitic inflammation of the scalp that results in alopecia.

Cinnabaris is especially useful in the combination of syphilis and sycoosis, no matter what the tissues affected.

Gualacum has been found curative in papular syphilitic skin eruptions with fetid odor.

Nitric acid covers syphilitic ulcers that tend to spread in area rather than in depth, with copper-colored eruption about the anus and buttocks.

Silicea has itching, moist or dry eruptions of red pimples or spots on the genitals.

Staphisagria will be found especially useful in mucous tuberculosis and condylomata, or dry pediculated fig warts and scurfy eruptions upon the skin.

Besides these remedies *Arsenicum album*, *Asafetida*, *Lycopodium*, *Corallium*, *Pterisidacea*, *Natrum sulphuricum*, *Aurum metallicum*, *Fluoric acid* and *Sulphur* will be found beneficial, even curative, in individual cases. In all instances the treatment will have to be continued over a considerable length of time and by preference the remedies should be administered in medium or high attenuation and not too often repeated.

It will be found necessary to give the syphilitic infant the benefit of the very best nourishment and sanitary conditions with which it can be supplied. It should be borne in mind that a great

many of the skin eruptions of syphilis in infancy are but the mildest expressions of the disease in hereditary form, and if there be a type of syphilis that is curable under protracted homeopathic treatment it is that type of the disease witnessed in the skin trouble of infants.

CHAPTER XCIX.

TINEA FAVOSA.

General Considerations—Symptoms and Course—Diagnosis—Treatment—Local Treatment—Medication.

General Considerations.—Favus is one of the most obstinate and distressing of the skin diseases to which children are subject. It is a contagious, vegetable parasitic disease characterized by the presence of elevated, umbilicated, cup-shaped, yellow crusts, each usually perforated by a hair, and varying in size from a pin-head to a silver half-dime. The eruption is more commonly seen upon the scalp, but it may appear upon any part of the integument. In severe cases the nails are attacked. If the scalp is the chief site of the characteristic type of the disease the cervical glands, and even the axillary glands, may become swollen, tender and indurated. In an epidemic of tinea favosa occurring among the inmates of the Protestant Orphan's Home at San Antonio I found, upon taking charge of that institution, that nearly a score of children from two to eight years of age were severely, even profoundly, affected by the presence of favus, their scalps being one mass of furus sores, while the neighboring lymphatics were enlarged and tender, almost the entire glandular system being involved in two cases.

Symptoms and Course.—Favus is essentially a disease of childhood, though in very rare cases it may attack adults nursing children who are subjects of the disease.

It begins as a superficial inflammation or hyperemic spot, usually at the site of a hair follicle, the inflammatory process being more or less circumscribed and the area primarily affected being slightly scaly. A yellowish-brown crust soon forms at its initial site, this becoming as large as a small pea. It is cup-shaped, its under surface pressing down upon the papillary layer, causing an excavation beneath it that is usually found to be in a state of suppuration. The crust umbilicates and becomes dry and friable. It is of a sulphur color and the moisture that is exuded from beneath has a peculiar mousey odor. As it spreads out upon the scalp the hair becomes matted and bound firmly to the scalp, new points of suppuration occurring beneath the crusts. In some

cases the exudation is so extensive that if neglected it will trickle down upon the scalp and neck, causing new spots in its course. In malignant epidemics of favus the mucous membranes have

become involved, doubtless from the introduction of the parasite upon the subject's fingers, and by developing in the mouth, throat and stomach there has been started up an attack of gastritis favosa resulting fatally. Though generally located upon the hairy portions of the body favus may attach itself to any portion of the skin. The case shown in Fig. 73, taken from a photograph, reveals the presence of sharply defined bunches of favus crusts over areas of integument that are not liberally supplied with hair. Favus is observed more commonly among children who are poorly fed and illy cared for. It is a preventable disease and should never be seen in its severest forms; when once it becomes located in an institution or large family it is almost impossible to eradicate it. In the ordinary course of the disease the constitutional symptoms are not severe.

The child is rendered fretful, peevish and worrisome, its skin itches and if the glandular system becomes involved it may suffer more or less pain from glandular inflammation. If considerable areas of scalp and integument become affected it may be rendered quite ill, and if the mucous mem-

branes are attacked vomiting and diarrhea occur, with emaciation and prostration. In "scrofulous" children who are subject to vicious attacks of favus suppuration of individual glands may ensue, with exhaustion from abscess formation.

Diagnosis.—The diagnosis of favus is not attended with difficulty. No other skin disease has the friable, cup-shaped crusts of *tinea favosa*, nor has any other ailment the peculiar mouse-like odor. If the exudation has come in contact with healthy skin and set up an eczematous inflammation it is possible that this feature may render the diagnosis somewhat confused; but eczema does not have the mouse-like odor of favus, nor does it have the symmetrical, cup-shaped, sulphur colored crusts of this disease. The fungus that causes it is the achorion of Schönlein and consists of mycelium and spores that are readily discoverable under the glass after the crusts have been moistened with liquor potasse. The mycelium consists of narrowed, flattened threads or tubes running in all directions. These spores are round or oval bodies, one twenty-three thousandth to one fifty thousandth of a milli-



FIG. 73.

meter in diameter. The parasite penetrates to the hair follicles and burrows between the superficial hairs of the cornuous layer. It may also attack the inner and outer root sheaths of the hair, and even invade the hair follicles.

Treatment.—Constitutional treatment is absolutely necessary in all cases of favus occurring in debilitated subjects. While it may be seen in children who are fairly robust yet it is more often found in subjects whose parents are syphilitic or tuberculous. Children whose surroundings have been unwholesome since birth, whose nourishment has not been of the best, whose constitutional base is not of the best and who are commonly known as glandular subjects are the ones in whom favus is more likely to be seen. It is not easy to understand just why vegetable parasitic diseases attack children whose systems are less resistant to the invasions of disease generally. It may be because the mycelium is introduced through the blood by means of food, or it is possible that it is because their hair follicles are not in a perfect state of health, it being generally understood that children with general constitutional dyscrasias are not possessors of healthy, vigorous hair. Be this as it may the fact remains that it is in these subjects, whether in orphan asylums or private families, in whom favus is commonly observed.

LOCAL TREATMENT.—It is absolutely necessary in every case of favus to have the hair cut very close in order that proper local measures may be instituted. For this purpose the clippers are better than the scissors. I have never been able to destroy the parasite except by vigorous local treatment, and it is impossible to get at it unless the child be rendered as hairless as possible.

The dense crusts must be removed and this cannot be accomplished satisfactorily except by softening them by the application of oil. For this purpose lanoline, vaseline, various cerates and ointments have been used. Olive oil, almond oil, and certain carbolized oils have been employed also, but the most satisfactory preparation has been the oil of ergot. No matter what oleaginous substance be resorted to the crusts and surrounding epidermis should be kept covered with it from twenty-four to thirty-six hours, it being necessary to keep the crusts in contact with the selected oil for that length of time to secure their ready removal. When once they have been sufficiently softened the entire scalp may be treated to a linseed meal poultice for the purpose of securing their easier removal and the opening of all affected hair follicles. This may cause some slight febrile reaction and discomfort to the patient, but it is effective and not harmful. The entire affected area should be covered by a large, soft, warm poultice repeated every three or four hours until the desired effect has been produced. The only objection to the poultice is the presence of the moisture necessary to its successful use. This occupies the hair follicles and causes

swelling of the softened tissues so that it is not so easy to introduce the antiparasitics to be used later. However, the scalp must be cleansed, and cleansed thoroughly, of all crusts, pus and debris. Following upon this cleansing process the application of boroglyceride to the scalp, in twenty-five to fifty per cent. strength, will be found helpful in the treatment.

After an hour or two of the application of the boroglyceride the crusts will all be readily removable, if, indeed, the scalp has not already been completely cleansed of them. The scalp should now be rendered perfectly dry, by careful mopping with absorbent gauze, and the selected parasiticide should be applied. For this purpose the various preparations of mercury have been used, but are not recommended. Constitutional symptoms may supervene upon their use, and, furthermore, the albuminous surface is sure to be coagulated by this agent (Shoemaker) the parasite enjoying security beneath it. In the epidemic mentioned in the early part of this chapter, during which all possible means of treatment were tried and exhausted, the only effective agents toward the complete destruction of the *tinea favosa* that were found to be reliable were the oleates of mercury and copper, preferably the latter. Adopting Shoemaker's formula, an ointment consisting of an ounce of simple cerate and half a drachm of the oleate of copper was thoroughly applied over every affected portion of the scalp after the latter has been cleansed in the manner described. The application was repeated every third day for three or four weeks, with the result that in every instance the cure was rendered complete; whereas for several months the Home had been a veritable pest-house of favus.

It is not believed that it is possible to eradicate this disease by constitutional treatment alone. It is strictly of parasitic origin and it is as necessary to destroy the parasites as it is to render the skin healthy in order to affect a thorough cure. It is not believed that either measure alone will suffice. The inmates of the San Antonio Home had had carefully administered constitutional treatment for more than a year at the hands of others, besides the author's best endeavors for several months' before the local measures described were instituted; yet not until these vigorous procedures were adopted and carried out systematically was it possible to rid the unfortunate subjects of the vicious manifestations of favus from which they had long been sufferers.

MEDICATION.—Remedies that have been found most beneficial in the treatment of favus have been *Arsenicum*, *Catarrus carbonicus*, *Sulphur*, *Mezerium*, *Graphites*, *Dulcamara* and *Baryta*.

Arsenicum iodatum is especially beneficial when the scalp is rough and dry, covered with dry scales and scabs extending to the ears and back of the neck, the cervical glands being enlarged and indurated.

Graphites and *Kali muraticum* were found more helpful where there was extensive exudation from under the crusts, matting the hair together and causing great discomfort. The distinguishing symptoms of *Graphites* are the yellow crusts and the matting together of the hair in thick mats by a firm, hard sulphur-colored exudate. *Kali muraticum* has a clearer exudate than *Graphites*, which forms more abundantly, and its crusts are not of the deep-yellow color of the latter remedy.

Meserous is useful when the entire scalp is covered with a thick, leathery crust, under which pus collects. It is also beneficial when the eruption upon the head and scalp is dry and attended by intolerable itching.

Calcaria carbonica and *Calcaria sulphurica* are useful in the typical *Calcaria* subjects when the glands are involved and the patient is sluggish and lymphatic. The scalp is covered with crusts, the child suffers from chronic sore eyes, and the eruption spreads over the face, forming thick scabs which break the tissue beneath, causing it to crack and bleed.

Baryte is especially beneficial when the disease extends to the ears and posterior portions of the neck involving the middle ears and the glandular structures. There is scrofulous enlargement and suppuration of the glands.

Besides these remedies *Dulcamara*, *Calcaria sulphurica*, *Staphisagria*, *Pariana* and *Thuja* have been found more or less beneficial in individual cases. In a general way I do not believe I have found constitutional treatment alone to produce any effect whatsoever upon the local disease. The glandular symptoms, the general constitutional state, the appetite and digestion, have all been improved, and constitutional remedies have doubtless had some effect upon the cases in hand; but to attempt to cure tinea favosa by constitutional treatment alone is worse than useless, as valuable time is lost during which the parasite but gains firmer lodgment.

CHAPTER C.

LICHEN.

Definition—Varieties—Etiology—Symptoms and Course—Diagnosis—Pathology—Treatment—Medication.

Definition.—Lichen is an acute inflammatory disease presenting as its characteristics small, flat and angular papules that are smooth or shining, discrete or confluent, attended by more or less itching and slightly umbilicated, broad, flat and glossy. They are red or violet-red in color, and while ordinarily discrete and arranged

in groups or in lines they may coalesce and form various-sized, sharply-defined patches covered with thick, shiny scales.

The eruption is more commonly seen upon the flexor surfaces of the wrists, flanks and lower part of the abdomen. The face is not usually attacked; occasionally the calves of the legs, knees and lips are the sites of the pustules of lichen.

Varieties.—Lichen is seen in two chief varieties—the acuminata or lichen ruber, and the plain or lichen planus. Lichen ruber is extremely rare, nor is lichen planus a common ailment.

Etiology.—The causes of lichen are not understood. There is a specific form in which the eruption comes out acutely in groups seen in rickety children, though it may also occur in subjects of fairly robust health. It is thought that sudden checking of the perspiration and chilling of the skin serve to excite the eruption, but if these were causes it would certainly be among the more common types of skin disease in children in whom these conditions frequently occur.

Symptoms and Course.—The initial symptoms of lichen are the appearance of small pin-point or pin-head, rounded, reddish, disseminated papules that are firm and shotty, and that show but little disposition to group. They spread rapidly, are attended by some fever, and in susceptible subjects gastric derangement is also observed as the eruption disappears. The surfaces of the individual papules are smooth, but as they umbilicate they become the site of a dull, furfuraceous desquamation. The course of the inflammation varies from a few days to a few weeks, or it may drag along over an indefinite period of time with fresh lesions occurring from time to time.

In the severest types of lichen ruber papules develop upon almost the entire surface of the body, the skin becomes generally infiltrated, the skin of the face and neck is fissured, brittle and scaly, and the integument over other surfaces, especially over the palms of the hands and soles of the feet, becomes so thickened and infiltrated that chagades are formed, and walking is attended by intense pain. The hairy portions of the body and the nails are eventually affected, the nails becoming thickened and of a dull, yellowish color, and marked by longitudinal ridges. In its more malignant type, which, fortunately is very rarely observed—although it is seen in children whose surroundings are unwholesome, whose food is non-nourishing, and whose constitutions, habits of life and domestic surroundings are depraved—a fatal issue occasionally occurs from general marasmus and interference with bodily nutrition.

Diagnosis.—Mild cases of lichen may be mistaken for simple acute, papular eczema, the papular variety of the syphilides, pityriasis rubra, psoriasis, and even by careless observers for the simpler type of small-pox or varioloid in its initial stage, prior to umbilica-

tion. The papules of lichen are small, are usually developed first upon the extremities, are attended by a variable amount of itching and do not increase in size nor become pustular as in eczema; the papules are also more numerous, and there is severe itching. In psoriasis the eruption rapidly spreads, individual plaques becoming quite large in area. The papular syphilide increases in diameter and becomes pustular. It has also, as a rule, constitutional evidences of the nature of the disease.

Pathology.—In lichen planus there is inflammation of the papillae and upper portion of the corium. The vessels of the papillary layer are dilated and tortuous, the interspaces being crowded with leucocytes. Umbilication occurs at the orifices of the sudoriferous ducts. In lichen ruber all the layers of the skin are affected. The stratum corneum is greatly thickened, while the stratum mucosum is not only increased in thickness but made irregular in outline. The lower structure is infiltrated with leucocytes, while the stratum lucidum and stratum granulosum are indistinct in consequence of imperfect transformation or development of their cell structure. The papillae of the corium are thickened and its blood vessels are dilated. The sudoriferous and sebaceous glands are not affected except at the mouths of their ducts; the peripheral nerves are subject to the destructive process of lichen ruber, this doubtless having to do with the marasmus and impairment of the general health observed in malignant cases of this type.

Treatment.—It is of first importance in all cases of lichen ruber to pay attention to the general condition of the health. Under old school treatment a general course of tonics and supportive remedies has been found most helpful, attention being paid later to the eruption. Local applications for the purpose of allaying the pruritis, which in some cases is very annoying, and for improving the general state of the skin, as alkaline baths, tar ointments, soothing solutions impregnated with carbolic acid, boracic acid or other stimulating medicants, have been employed with varying success. As a rule the only local treatment that will be required will be perfect cleanliness, as secured by means of occasional baths with soft water and tar soap, the skin being thoroughly dried after the bath, especially at the site of the eruption. If the itching be intolerable the affected areas may be bathed with a weak carbolic acid lotion or an aqueous solution of thuja, calendula, hamamelis, or a weak aqueous dilution of cantharis or urtica urens. In other cases the application of tar ointments, graphite cerate, dry boracic powder or other selected internal application may be justified.

MEDICATION.—*Armeniacæ*, preferably *Armeniacum flosatum*, will be found a very helpful remedy in lichen ruber tending to break down and coalesce, and characterized by constitutional symptoms.

Graphites will meet those cases in which the scaling is thick and crustaceous, especially if there be excoriated from the nodules a

sticky secretion that forms into thick yellow crusts, as is rarely the case in scrofulous subjects.

Antimonium crudum is homeopathic to cases in which the eruption is unusually firm and hard, especially when it remains discrete and attacks only individual portions of the skin, as the flexor surfaces of the wrists, the calves of the legs or other local areas.

Thaps is an excellent remedy in unwholesome states of the general skin, the eruption being engrafted upon a sycotic base.

Calcaria carbonica and *Calcaria sulphurica* may be needed in special cases in the so-called scrofulous subject whose general health is below par, and in whom the eruption occurs more especially about the hair follicles, with enlargement of the glands, chronic sore eyes, and other evidences of a strumous state of the system.

Natrum muriaticum, *Natrum sulphuricum*, *Sepia*, *Kali muriaticum*, *Mercurius*, *Sulphur* and other remedies may be required in special cases.

The diet of the lichen child should be wholesome and nutritious, as free as possible from fat and dyspepsia producing foods, while its hygienic surroundings should be perfect, and its local sanitation be changed from the condition of unwholesomeness in which its patients usually live to one more hygienic and satisfactory.

CHAPTER CI.

LEUCODERMA.

General Considerations—Etiology—Symptoms and Course—Treatment—Medication—Diet.

General Considerations.—Leucoderma, also known as vitiligo, is defined as a disease involving the pigment of the skin and characterized by the formation of progressive milky-white patches surrounded by increased pigmentation. They are usually round or irregularly shaped patches in which the skin is very much whiter than the surrounding integument. This peculiar color of the skin is most often observed upon the backs of the hands and on the face and neck, though it may occur upon other parts of the body. In pronounced cases the spots are milky white, showing very plainly, especially when occurring in brunettes. Although not more subject to this ailment than the Caucasian yet when it occurs in the Negro it is called "white disease." In the superstitions of that race it is presumed that some punishment has overtaken the subject of leucoderma whereby he is about to turn white.

Etiology.—Vitiligo is seen more especially in children from ten to fifteen years of age, though it is also observed in much younger subjects, and is not altogether confined to child-life. It is presumed to be due to disturbed innervation. It is certainly more commonly seen in children who are nervous and in whom there is a tendency to chorea. It may occur as an independent affection, and in some cases is observed in common with alopecia, morphea and eczema.

Symptoms and Course.—The first indication of the presence of vitiligo is the appearance of small white spots on the backs of the hands, the neck, face or trunk, these showing more plainly than they otherwise would because the surrounding integument is increased in color by pigmentation. From these minute spots the milky whiteness of the skin spreads symmetrically until large plaques are formed, being almost invariably surrounded by an area of pigmentation that is darker than the surrounding integument, as though the pigment were driven back from the leucodermic spots into the adjacent structures. The patches grow slowly, and by coalescing sometimes form large, irregularly shaped blotches. The disease progresses very slowly unless the general health of the patient is bad, in which event the patches may increase in size with considerable rapidity, the child's features being wretchedly blotched by large milk-white patches, practically or completely surrounded by integument that is darker than the normal skin, narrow patches of the latter bridging the affected areas.

Leucoderma is without constitutional symptoms except that in nervous subjects in whom it is commonly seen these symptoms increase, the choreic state becomes more pronounced, and the general health of the patient is more impaired as the leucodermic spots increase in size and number, the spread of the latter being wholly due to the increased affection of the general health, which is in no sense dependent upon the vitiligo.

Treatment.—The treatment of this peculiar ailment will have to be directed toward the nervous system. By no means is the affection a disease of the skin. It is discussed in this relation because of the discoloration of the integument which chiefly attracts attention to the health of the patient in very many cases. The correct treatment is the upbuilding of the health by supportive diet, fresh air, outdoor exercise, the proper exhibition of constitutional tonics, and the administration of those remedies that improve the innervation of the leucodermic subject.

MEDICATION.—*Arsenicum album* continued over a period of weeks, in medium attenuation, has served me better than any other remedy in the treatment of vitiligo. The symptoms calling for its use are the general debility of the patient, the rather anemic state of health, the feeble and irregular heart action, debility and disturbed nutrition so common to this ailment.

Arsenicum iodatum is also a remedy of value and may be used in cases in which the *album* is not clearly indicated or where the symptoms present a combination of those of *Arsenicum* and *Iodine*.

Ignatia has been found helpful in young girls who are excessively nervous and hysterical, whose sleep is disturbed, who are easily excited when the heart's action is irregular, and in whom outbreaks of nervous headache occur.

Phosphorus applies to leucodermic subjects who suffer from shortness of breath, palpitation of the heart, impeded respiration, hemie murmurs and other *Phosphorus* symptoms. In stubborn cases in which *Arsenicum* fails I have found *Phosphorus* of no little value.

Sulphur, *Thuja*, *Calcarea*, especially *Calcarea phosphorica*, *Antimonium*, *Zincum*, *Rhus tox.*, and other remedies applicable to semi-choriic subjects are useful in leucoderma and will be found beneficial in special cases. If it be ever borne in mind that the milky whiteness of the skin is due to disturbance of innervation as yet not understood, and remedies be directed toward the nervous system and the general health, the best possible results will be obtained. The ailment is not characterized by subjective symptoms and is in no wise dependent upon or associated with other skin diseases, hence remedies directed to the skin, either constitutionally or locally, will be of no avail.

DIET.—Subjects of leucoderma are usually children in need of a supportive diet, whether they be met with in squalid homes or mansions. Blood and nerve-making foods, as rare steak, roast beef, nutritious vegetables, fowl and game of all kinds in season, cod-liver oil, petroleum emulsion, red wine with meals, and other upbuilding diet will be required. Knick-knacks, sweets, pickles, in fact all articles that disturb the digestion and interfere with the demands for wholesome nourishment should be tabooed. In special cases it may be wise to prescribe a change of climate, particularly to the mountains or sea shore, to improve the innervation of the individual and to encourage his appetite and digestion.

CHAPTER CII.

SCABIES.

General Considerations—Symptoms and Course—Diagnosis—Treatment—Local Treatment—Medication and Hygiene.

General Considerations.—Scabies, or itch, is a contagious, animal parasitic disease of the skin produced by the *acarus scabiei*, Fig. 74, which gives rise to a characterized multifiform eruption of peculiar distribution, attended by intense itching, the skin

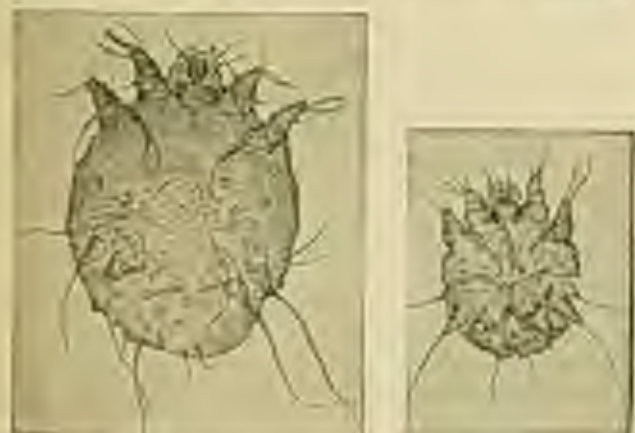


FIG. 74.—Male and Female *Acarus Scabiei*.

being covered by papules, vesicles, pustules, excoriations and crusts, the parasite pustules or cutaneous structures forming burrows or *cuniculi*, upon which the scabies sores develop.

The chief site of the itch sore is over surfaces protected by tender skin, as between the fingers, on the wrists, especially the anterior surfaces, in the folds of the axilla, on the abdomen, about the anal fissures and genitals. In boys who run barefoot it is also seen between the toes and it occasionally attacks other portions of the body.

The *cuniculi* caused by the *acarus* may be tortuous, straight or zigzag. They vary in length from one-eighth to one-half an inch. The burrow is formed by the impregnated female parasite—which penetrates the epidermis obliquely to the rete, depositing from ten to fifty ova—and traverses the integument.

The male *acarus* remains upon the surface, or finds lodgment in the crusts or scales. The ova that are deposited in the burrows

by the female parasite soon become impregnated and in turn burrow in different directions, forming new vesicles, papules and pustules, this course covering a period of about three weeks, the presence of these parasites in the skin and the processes they go through in developing causing intense itching. Most children indulge in the gratification of scratching viciously, thus producing secondary lesions, which add to the itch sore the presence of abrasion of the skin and perhaps eczematous inflammation, so that, all told, the itch subject presents an unsightly appearance.

Symptoms and Course.—It requires from two to three weeks after the introduction of the female acarus into healthy skin before the impregnation of its ova and their burrowing process develop the initial symptoms of itch. Slight pains or irritation occur between the fingers or elsewhere which excite vigorous scratching. Excoriations or hemorrhagic spots arise from this cause and in some cases the skin is fissured and abraded to some extent. The itching may be mild in some cases, in others exceedingly exaggerating. There are no constitutional symptoms of importance in the course of a typical case of scabies, though where large areas of skin become affected in children who are not resistant and vigorous the intolerable itching and annoyance that are present may seriously impair their health, disturbing digestion, breaking their rest, interfering with their play and otherwise rendering them unhappy and miserable.

The course of scabies is essentially chronic. It shows no disposition whatever to spontaneous disappearance and may last pretty well through a life-time. This chronicity is the feature of the disease that is responsible for the domestic name of the "seven year itch."

Diagnosis.—There ought to be but little difficulty in diagnosing scabies. The characteristic feature is the peculiar burrows made by the female parasite. In the first few days of the disease it is not possible to detect these canals except under a strong glass. Later when the canals have been dug out in different directions by the young acari it is possible to discover the nature of the disease by observing the canals running out in different directions from the main line, which was the initial burrow of the parasite.

The insect may be seen in occasional cases in the immediate locality of the vesicles, never in the vesicle itself, by opening up the canal with a fine needle and looking for the parasite under a glass in the white speck at the distal end of the canal, this being at this time its field of operation.

It is not easy to detect the canal in older subjects, as the skin is harder when upon the hands of workers in chemicals, or washer-women, or others whose hands are constantly soaked in water. In these subjects it will be necessary to examine over other portions of the skin, while in children and young subjects the parasites and

their canals can generally be discovered in the delicate skin between the fingers.

In the absence of the discovery of the parasite or its burrows the time of contagiousness of the disease, or time of the development of the eruptions upon the patient, is from two to three weeks after exposure. The favorite location of the parasite upon the more delicate skin and its predilection for young children should be borne in mind.

The vesicles of scabies are somewhat smaller in form than those of eczema, and the eruption of the latter is much more wide-spread and general.

The papules of scabies are isolated and their appearance upon certain regions, as the fingers, toes or buttocks, with a lack of eczematous inflammation surrounding, should easily enable the physician to diagnose the disease as itch.

Treatment.—The nature of the disease being understood it would seem to be hardly necessary to declare that the only and really effective treatment of scabies implies the destruction of the mites and their ova that are the cause of the eruption. For the annoying symptoms that are present in susceptible subjects, as intense, even exasperating itching, causing the patient to become perfectly furious and quite beside himself, constitutional remedies may be required.

If the annoyance is so great that the child's general health is impaired, his appetite disturbed, his sleep broken and his life rendered miserable, internal medication is unquestionably demanded. Upon the destruction of the parasite and its eggs depends the eradication of the disease, and, therefore, as long as the ova of the acarus are left to mature and burrow in new directions just so long will the disease remain uncured.

LOCAL TREATMENT.—Among the external applications that have been found most generally beneficial sulphur stands first. It may be used in the form of precipitate sulphur, with balsam of Peru and naphthol, or it may be used singly. A very satisfactory ointment for children of sensitive skin consists of sulphur, four drachms, balsam of Peru four drachms, adipis and petrolati, each one-half ounce. This should be rubbed in over all irritated portions of skin thoroughly every night and morning. For adults and subjects whose skins will bear stronger preparations it would be better to use sulphur, one ounce, balsam of Peru one-half ounce, beta naphthol two drachms, and of adipis and petrolati equal quantities sufficient to make four ounces of this ointment. This may be used in the same way for children, though it is too harsh for children of delicate skin.

Stryax is also employed as an ointment in the strength of one part to two or three of lanoline or lard. In order to be effective this or other ointments that are employed must be thoroughly

rubbed into the skin, every portion of the affected area being completely impregnated with the medicament. In the course of a few days the itching will begin to cease and general improvement will be manifested. If the slightest degree of itching returns it is evidence that all the ova have not been destroyed and the treatment should be repeated. In exceedingly obstinate cases it is well in addition to the ointment suggested, to use a soap composed of petroleum, fifty parts, white wax forty parts, alcohol fifty parts and soap one hundred parts (Emery), bathing the skin as often as is necessary with water thoroughly impregnated with this soap. It may also be rubbed over the affected spots and allowed to dry thereon. For the same purpose carbolated acid and olive oil, one part to fifteen, have been recommended and have proven advantageous.

Naphthol with *adipis recentis*, one ounce of the latter to one half drachm of the former, is recommended by Shoemaker, while Caposi advises an ointment composed of naphthol fifteen parts, pulverized creta alba ten parts, green soap fifty parts and axungia one hundred parts. Instead of axungia Shoemaker suggests the use of lanoline, because of its greater penetrating powers.

MEDICATION AND HYGIENE.—Itch is much more commonly seen among children of dirty habits and those who live in squalid quarters and filthy surroundings, whose skins receive no attention, whose hygiene is bad and whose nourishment is unwholesome. If the best effects are to be produced all these must be changed. Cleanliness is akin to godliness in all skin diseases, and while the free use of water is not permissible in all skin ailments yet it is essential that the general integument should be kept in as wholesome a condition as possible by proper diet, exercise, bathing and general sanitation. Further than this internal medication is unquestionably of value.

Sulphur is king in scabies, both externally and internally. The skin is unhealthy, the child itches exasperatingly, especially at night when the skin is uncovered, and repels the bath because of the irritation it causes to the skin. If the itch mite has burrowed into the axillary regions or any other portions of the system supplied with lymphatic glands these are apt to be enlarged and tender. *Sulphur* allays their irritation and soreness.

Arsenicum.—If the child has become debilitated and worn out because of the exasperating annoyance caused by the itch mite *Arsenicum* may be required as a general tonic and the simillimum to the case. The child is restless at night, is peevish and fretful, its appetite is capricious, it is weak and anemic and its skin is unhealthy. It is only necessary to suggest that in order for *Arsenicum* to be indicated in itch or any other disease the child must present a typical arsenical picture.

Iodine.—Iodine will be found helpful in unhealthy, leathery skin, with large itch sores, the skin being infiltrated and hypertrophied, the glands swollen, the scalp invaded, the nails crumbly and brittle and the integument generally unhealthy. As with *Argemone* so with *Iodine*, the entire image of the remedy must be present if it is to be used with success. Besides these remedies *Kali maritimum*, *Graphites*, *Calcarea carbonica*, *Hepar sulphur*, *Mercurius* and *Thuja* may be required in special cases.

While *acarus* attacks children in vigorous health it is much more annoying to and destructive in the integument of unhealthy subjects. All such should receive constitutional treatment and the benefit of nourishing diet and hygiene if the system is to be rendered more resistant to the annoyance of the itch pest, and if nature is to be given the best opportunity to overcome this and other conditions of skin disease.

SECTION X.

DISEASES OF THE EYE.

CHAPTER CIII.

CONJUNCTIVITIS—TRACHOMA.

General Considerations—Simple Conjunctivitis—Symptoms and Course—Treatment—Polyeternal Conjunctivitis—Symptoms and Course—Treatment.

General Considerations.—As already suggested in the chapter on ophthalmia neonatorum the eyes of the new-born infant need careful attention and cleansing. It is not believed that it is necessary to chemicalize the eyes of all children by a solution of nitrate of silver, however weak, or other chemical agent, albeit it may be wise to apply this or other chemical solution in subjects of unwholesome surroundings, whose advent into the world has been accomplished through filth, and possibly through a vaginal outlet contaminated by gonorrhea or other specific disease. In general it is sufficient as a prophylactic measure to carefully cleanse the eyes of all extraneous matter by gently wiping them with absorbent cotton or surgical lint, or, perhaps, by carefully washing them with sterilized water, drying the conjunctiva and edges of the lids afterward. It is not believed that it is necessary in a work of this character to enter into extensive consideration of the various diseases to which the eye is subject. For the purpose of a more complete knowledge the student and practitioner will find it better to refer to general works upon diseases of the eye. Only the simpler ailments that are met with in general practice and that must necessarily receive consideration at the hands of the family physician will be here considered.

Simple Conjunctivitis.—Conjunctivitis may show in the new-born child in the simple catarrhal form, or in the polyeternal or pustular form. The simpler variety is often the result of undue exposure of the child's eyes to bright light, either sun-light or artificial light, or more often to unnecessary exposure to changes of the weather. The conjunctival membrane is very delicate and easily chilled, and unless care is exercised in taking the baby out in the fresh air, especially in the winter season or when the weather is damp and cool, catarrhal conjunctivitis may easily be

set up. Another cause of this simpler type of inflammation of the external structure of the eye is a lack of proper cleanliness of the lids and face. Particles of foreign matter being brought in contact with the conjunctiva during the bathing of the baby, or from lack of proper cleansing of its canthi, may serve as sources of irritation and set up inflammation.

SYMPTOMS AND COURSE.—The first indications that are observable are slight swelling and puffiness of the lids and indisposition on the part of the baby to expose its eyes to light, and, perhaps, slight restlessness of the child, with feverishness. These symptoms may even pass unobserved, the first noticeable sign being an accumulation of mucoid or sticky secretion that collects upon the lids or eye-lashes, rendering it impossible for the baby to open the eyes or for the nurse to separate the lids because of the degree of agglutination that is present. The discharge is at first watery or mucoid in character but later becomes mucopurulent and yellowish or creamy in color, though not so pronouncedly so as in the typical purulent conjunctivitis, which is quite a different disease from the simple form under consideration.

TREATMENT.—It is not often necessary to do more than cleanse the eyes with sterilized water, gently removing the incrustations from the lids and cilia, at the same time prescribing *Acute*, *Belladonna*, *Euphrasia*, *Dulcamara* or *Ferrum phosphoricum*, as indicated; *Acute* if the child is restless and feverish, the lids red and swollen; *Belladonna* if the eyes are excessively sensitive to light, and the admission of light causes the baby to cry therefrom; *Euphrasia* if the eyes are suffused with tears which excoriate the lids and cheeks. *Allium cepa* is also useful in this connection. *Ferrum phosphoricum* will be required if the lids are somewhat inflamed and the secretion is mucoid in character.

It will be found helpful in special cases to lay pledgets of lint from cool water, freshened every few minutes, upon the lids if they are red and sensitive. Mild collyria, as weak calendulated water or a mild lotion of hamamelis, or, perhaps, a very weak solution of boracic acid, may be useful in special instances, though as a rule local applications are not at all necessary.

It may be well to darken the nursery for a few days, or, if it be not desirable to confine the baby to the house, to cover its eyes with a soft handkerchief or eye bandage during its daily outings. As a precautionary measure the baby should not be allowed to lie with its face toward the light when asleep, nor should the nursery be lighted at night.

Phlyctenular Conjunctivitis.—This form of conjunctivitis, also known as pustular conjunctivitis, is a much more important ailment than the simple form briefly described. It is characterized by the presence of vesicles or papules upon the conjunctiva, usually near the corneal margin. There may

be a single papule, or phlyctenule, or a number of them. They are semi-transparent, firm, yellowish elevations that are raised somewhat above the surrounding conjunctiva, the tissues immediately adjacent to the phlyctenula being more or less infiltrated. Each individual pustule forms the centre of a spot of localized inflammation and in the course of a few days ruptures and leaves a shallow ulcer. This type of conjunctivitis is likely to recur, dragging along over a considerable period of time with more or less intermittent course, the tendency being toward the development of chronic pustular conjunctivitis. It is most often observed in ill-nourished children of constitutional dyscrasia, whose sanitary surroundings are not of the best and whose genealogy is questionable from the physical viewpoint. The disease is almost wholly confined to children, though occasionally observed in older subjects.

SYMPTOMS AND COURSE.—Presenting as individual pustules near the margin of the cornea, as described, there is more or less photophobia and pain, the former symptom predominating, the latter being comparatively insignificant in most cases. The conjunctival membrane is more or less suffused, though there is not an excessive secretion of tears. The sensitiveness is so pronounced in some cases that a mild form of blepharo-spasm is observed. Within a week or more from the time the phlyctenule is observed it softens and disintegrates, leaving its shallow, open ulcer. Others are forming meanwhile, to go through about the same course, so that in individual cases in the ordinary course of the ailment a period of three, four or more weeks is covered. The tendency is to chronicity and a lack of perfect cure.

TREATMENT.—As may be imagined the treatment of phlyctenular conjunctivitis to be successful will have to be directed toward the constitution of the patient. Besides nourishing food, outdoor air and exercise, the eyes being carefully guarded against admission of bright light in subjects in whom photophobia is pronounced, it will be necessary to administer such remedies as *Sulphur*, *Tinaja*, *Calcareo carbonica*, *Arseaticum*, *Mercurius solubilis*, *Graphites*, *Palustilla*, *Hepar sulphur*, *Baryta carbonica* and *Mercerius*.

Sulphur is more especially useful as a basic remedy, administered in medium attenuation at long intervals in subjects of strumous diathesis. There are sharp, lancinating pains in and about the site of the pustule, worse in the afterpart of the night, the lids being agglutinated in the morning, often thickened and the subjects of blepharitis marginalis. Photophobia is not very pronounced in the *Sulphur* case, the entire symptomatology being that of sluggishness and torpor.

Calcareo carbonica will be found especially beneficial in fleshy, phlegmatic, flabby children with unhealthy skin and

enlarged glands. The margins of the lids are sore and inflamed, a gummy secretion agglutinating them every morning. The eyes are sensitive to light and weep almost constantly. The child's skin is unhealthy, its appetite variable, its family history that of struma.

Hepar sulphur is especially indicated in phlyctenular or other types of conjunctivitis following upon eruptive disorders, especially measles. The child has a tendency to boils, pimples and styes. Its individual eye symptoms in this type of conjunctivitis are intense photophobia and exquisite sensitiveness of the eyes to touch. If the child is old enough to complain it will make complaint of sharp, sticking, burning pains in the eyes.

Mercurius solubilis or *vivus* will meet many cases of phlyctenular inflammation in children of syphilitic parentage, and in those who have a tendency to nightly restlessness and bone pains, with aggravations of the eye symptoms in the night. The pains are severe, even neuralgic in character. The child also suffers from carache and enlargement of the glands of the neck. If it has had several attacks of conjunctivitis the lids are thickened and distorted. The discharges of *Mercurius* in all types of conjunctivitis are excoerating.

Pulsatilla is not often indicated in phlyctenular conjunctivitis but will yet occasionally prove helpful in the typical *Pulsatilla* subject, the child with light hair, blue eyes, sensitive disposition, and tendency to gastric disturbance, who is susceptible to the various types of conjunctivitis upon cold or atmospheric changes, the conjunctiva seeming to partake of the same delicate nature as the individual.

Besides these remedies *Graphites*, *Thuja*, *Psorinum*, *Mercurius nitrosus*, *Sepia* and *Miscereum* will be required in special cases, and will often be found curative when the remedies whose symptoms have been given at length fail to cover the case.

Local treatment will consist of proper cleansing of the eyes, as necessary, with mild collyria, protection of the eyes from bright light, and absolute cleanliness of the lids and canthi, whereby the conjunctiva may be spared local irritation.

Occurring in children of constitutional dyscrasia whose general systems are below par it becomes necessary to resort to proper climatic change in special cases, to improvement in the sanitary surroundings of the individual subject, and to attempts at upbuilding his general constitution by means of nourishing diet, even the liberal exhibition of carbonifying foods. Local attention to the eyes is less necessary by far than careful, general attention to the entire system. Only by the latter means and the exhibition of the properly indicated constitutional remedy can it be hoped that a recurrence of phlyctenular conjunctivitis extending over a period of many months, even years, will be averted.

Granular Conjunctivitis.—This is a type of inflammation in which granules form in the conjunctiva. These are round trachoma-bodies that occupy almost the entire palpebral conjunctiva, in severe cases causing swelling and infiltration of the orbital surfaces of the lids, with increasing vascularization and eventually more or less ulceration of the cornea. It is not observed as often among children as among adults, yet is by no means an uncommon result of other forms of conjunctivitis in children of strumous habits who are poorly fed and ill housed. It appears as an acute ailment, also, quite independent of other types of conjunctivitis, though much more commonly the condition is that observed in the "chronic sore eyes" of unhealthy subjects. Strictly speaking, the projections that are seen upon everting the lids are not granules nor enlarged follicles but a new growth that, after all, makes the lesion separate and distinct from follicular conjunctivitis.

Symptoms and Course.—The initial symptoms in the acute type of trachoma are intense photophobia, violent inflammation of the whole conjunctiva and copious lachrymation, followed by muco-purulent discharge. Eversion of the lids will show the conjunctiva to be swollen, intensely hyperemic, copiously bathed with moisture, and plentifully studded with little round bodies looking like the granulations of a wound. Upon wiping away the secretion that bathes the membrane the trachoma-bodies are found closely aggregated over the whole extent of the palpebral conjunctiva, especially of the upper lid. These little bodies are semi-transparent, even grayish-white, though in the acute type they are more likely to be of a bright pink, becoming grayish later.

Chronic trachoma sometimes follows upon the acute type of inflammation just described, but is more commonly observed as slowly developing conjunctival inflammation in unhealthy children whose eyes have been "weak" for some time prior to the discovery of granulated lids. In these cases the trachoma-bodies are grayish-white or semi-transparent, and are often arranged in rows or blotches. In some cases there is general hypertrophy of the conjunctiva with constant irritation of the cornea from the roughened condition of the upper lid, the lower lid rarely being as severely affected. As the trachoma-bodies soften under pressure and disintegrate there is a copious, muco-purulent discharge which is intensely contagious. Epidemics of sore eyes occurring in schools or among children in a given neighborhood are very likely to be trachomatous, usually the acute type of the ailment, though simpler forms of conjunctivitis also appear epidemically.

Trachoma invariably sets up complications that are more serious than the original disease. Extensive vascularization of the cornea, resulting in keratitis, pannus, pterygium, opacities of the

cornea, the result of keratitis, and even partial or complete destruction of the eyeball occur from severe cases of trachoma in stinking children under unfavorable circumstances.

TREATMENT.—This type of conjunctivitis requires active local treatment as well as constitutional measures directed toward the general systemic condition. In many cases it is absolutely necessary to evert the lids carefully, wipe away all secretions, and then bathe them with a ten per cent. solution of nitrate of silver applied by means of a camel's hair brush, this solution being immediately wiped away, the lids being carefully washed and wiped before the palpebral conjunctiva is allowed to come in contact with the corneal membrane. Mercuric bichloride, one to five thousand, may also be applied to the everted lids. Cupric sulphate, boroglyceride, tannic acid and other lotions have been used with varying success, and in recent years it has been the practice of oculists to squeeze out the contents of the trachoma bodies with a Knapp roller forceps, devised for the purpose. This process is painful and necessitates the use of an anesthetic.

Except in country practice, where oculists are not at hand, it is not wise for the general practitioner to undertake the treatment of trachoma. It is one of the most obstinate and destructive local affections of the eyes in children and requires the exercise of the best skill of the specialist.

MEDICATION.—Constitutional remedies that will be found helpful in subjects of trachoma are *Sulphur*, *Calcareo*, *Kali carbonicum*, *Graphites*, *Thuja*, *Argentum nitricum*, *Hepar sulphur*, *Mercurius niger*, *Silica*, and for the tubercular diathesis *Prorium* and *Tuberculinum*. It is not necessary to give the special indications with reference to the condition of the eyes. In all cases internal medication will have to be directed toward the general state of health of the trachomatous patient.

Besides constitutional medication these subjects will require wholesome, nourishing diet, sanitary surroundings, out-door exercise, fresh air, even change of climate. When seen in malarious districts of the South and Southwest, during the existence of malarial fevers in the summer and fall seasons, it may be necessary, in order to successfully combat the etiological factor that is operating to intensify the trouble, to base the treatment upon the malarious condition of the patient, antidoting by proper homeopathic medication the malarious manifestations of which the trachomatous state is but a part.

CHAPTER CIV.

ULCERS OF THE CORNEA.

General Considerations—Simple Ulcer—Purulent Ulcer—Indolent Ulcer—Sloughing Ulcer—Treatment—Medication.

General Considerations.—Among the more troublesome diseases of the eye in children are ulcers of the cornea. These are in the main due to previous inflammation of the conjunctiva, especially phlyctenular conjunctivitis and trachoma, but predisposing causes are malnutrition, the strumous habit, unsanitary surroundings, and general disturbance of the system, from whatever cause. They occur in several varieties, as simple ulcer, deep or purulent ulcer, indolent ulcer and sloughing ulcer.

Simple Ulcer.—The simplest form is that indicated by a grayish white spot located in the centre of the cornea, the site of a simple phlyctenule, this leaving a slight depression of the cornea with grayish infiltration in the tissues immediately surrounding. When located immediately over the pupil and resulting from a cone-shaped, grayish-white spot arising from slight injury, or occurring in ill-nourished children, it is termed the small central ulcer of childhood. As it heals a slight degree of opacity is left immediately in the centre of the field of vision, this interfering in proportion to its degree with the visual function. In rare cases the simple ulcer proves to be quite deep, leaving a dense opaque spot to mark its site.

Purulent Ulcer.—The purulent ulcer is usually the result of purulent conjunctivitis. It takes on more or less of a suppurative character, penetrating the layers of the cornea. Its appearance is yellow, with whitish, infiltrated margins. If the type of conjunctivitis that causes purulent ulceration of the cornea is severe, even malignant, the destruction of tissue may be considerable, the spot healing with a dense, white scar. This type of ulcer spreads in severe cases over considerable area, forming numerous corneal abscesses; in the severest cases these perforate the posterior layer of the cornea with the result that pus collects in the anterior chamber settling to its lower margin, forming what is termed hypopyon.

Indolent Ulcer.—The indolent ulcer is that type of keratitis which follows trachomatous inflammation of the lids. In some cases indolent ulcers are shallow and rather large; in others they are clear cut, almost as though a portion of the cornea were punched out. In healing they leave a less dense opaque spot than does the phlyctenular ulcer. Their course is chronic, and they are more

commonly seen in strumous children and those whose systems are below par. They sometimes resist well directed efforts at treatment for a long time.

Sloughing Ulcer.—The sloughing ulcer is that type observed in connection with purulent inflammation of the cornea. It is more often serpyiginous than round or oval. When this type of ulcer is observed the inflammation of the cornea has become deep-seated and its surface is hazy, swollen and infiltrated. The iris is generally affected, and pus forms in the anterior chamber, nearly all cases showing more or less hypopyon. In severe types pus is confined within the layers of the cornea, in which case its entire aspect is cloudy, vision being more or less, even completely, destroyed.

Phlyctenular ulceration presents photophobia as a pronounced symptom. The eye always dreads the light in inflammations of the cornea, in severe cases this dread being so great that it is all but impossible for the child to open its lids in order that the eyes may be examined. Blepharo-spasm is a common attendant, even the light that is admitted through the lids being so painful as to cause the lids to contract in continued spasm, over which the child has no control. In severest cases it is impossible to make a satisfactory examination of the eyes without the use of cocaine. Upon inspection phlyctenules will be found located over different portions of the cornea, varying in size from a minute point to spots two or three millimeters in diameter. These are usually raised upon the surface; their contents consist of serum, leucocytes and white corpuscles.

These severe types of cornetis or keratitis belong so commonly to children who are illy nourished, whose surroundings are unwholesome and whose constitutions are bad that they are exceedingly difficult of cure and very sluggish, usually attended by chronic inflammation and hypertrophy of the lids, and in true pustular types pustules will be seen about the face and palpebral edges. More or less secretion of a muco-purulent character is present. There is also unusual activity of the nasal membrane, with considerable escape of tears down the caniculi through the nostrils.

Treatment.—An essential factor in the treatment of keratitis, especially the severe types, is the administration of constitutional remedies, wholesome nourishment and general improvement in the personal hygiene and local surroundings of the little patient. Many cases of chronic sore eyes are infective. Therefore the subjects of purulent keratitis should not be allowed to play with other children, nor should they be allowed to indulge in habits at play that will tend to increase the irritation by means of dust, dirt and other foreign substances, as often befalls children in humble homes.

The eyes must be protected from the light by suitable dark glasses or bandages properly applied and changed as necessary. They should be kept as clean as possible, the lids and cilia being frequently bathed with tepid or warm water, to which may be added calendula, boracic acid, diluted chlorine water, listerine or eucalyptus. Repair may be encouraged by properly adjusted bandages which result in keeping the eye quiet during the healing process. If the discharges are acrid and if the bandage proves irritating it is objectionable and should be discarded. Local applications to the affected cornea are not to be practiced except by a specialist. Among others that are used are sulphur, mercurius dulcis, calendula or boric acid mixed with equal parts of sugar of milk, and hydrastis also so prepared. As a rule it is better to trust to mild collyria, perfect cleanliness, protection of the eyes from light and the upbuilding of the patient's health.

In cases in which the iris becomes involved in the process it may be necessary to resort to the use of a solution of atropia, a quarter of a grain to an ounce of diluted water, for the purpose of keeping the pupil dilated and relieving the intra-ocular tension. In exquisitely sensitive cases a two per cent. solution of hydrochlorate of cocaine will answer the purpose.

Poultices are usually worse than useless. If an external application of any kind is to be used the pith of sassafras, finely scraped and scalded, makes a satisfactory application; the water therefrom, applied on simple pledgets of lint frequently changed, will be found cooling and otherwise comforting.

MEDICATION.—*Asiaticum* will be more frequently called for in the corneal ulcers that are seen in weak, anemic children than perhaps any other single remedy. It is especially useful in ulcers that are superficial, the photophobia being excessive, the lachrymation profuse and acrid.

Hepar sulphur is indicated when there is a tendency to the formation of abscesses of the cornea, and in hypopyon. In the sloughing form of ulcer, with severe pain of a throbbing character, with intense photophobia and general infiltration of the conjunctival membrane, even to chemosis, *Hepar* will prove beneficial. The eye feels more comfortable from the application of warmth. *Hepar* is especially indicated when the eye is exquisitely sensitive to touch.

Graphites will be demanded in just the opposite type of case; the eyes are not especially sensitive to touch, even though severely affected. Phlyctenular keratitis, the result of phlyctenular conjunctivitis, in which there has been copious secretion of thick, creamy pus, calls for *Graphites*; the child is phlegmatic and is the subject of eczema and blepharitis marginalis, its skin being otherwise unhealthy.

Mercurius is called for when there are either superficial or deep ulcers with considerable infiltration surrounding. The discharges are profuse and excoriating, worse at night, with slightly aggravation of pain, boring in character.

Silica is called for in sloughing ulcers of the cornea and in chronic abscesses that fail to respond to other remedies. It also aids in clearing up opacities of the cornea following upon keratitis.

Calcarea carbonica will be needed in the typical *Calcarea* child with obstinate, even sloughing ulcers of the cornea, with a tendency to the formation of abscesses of that structure. The child's glands are enlarged, it is pot-bellied, dentition is slow and its muscles are flabby. Corneal ulcers seen in this type of subject will respond more quickly to *Calcarea* than to *Hepar*, *Mercurius*, *Arsenicum* or *Sulphur*.

Pulsatilla will be required for ulcerations in blue-eyed children with light hair and non-resisting temperaments, the subjects of repeated gastric derangements and consequent debility. Photophobia is intense, even though the ulcers be superficial and slight in extent.

Sulphur will be found especially useful in indolent ulcers with infiltration of the surrounding tissues, these being pale and edematous. The sores itch and burn intensely, especially at night, and the child experiences sharp, sticking pains in the cornea. The patient is constipated, generally torpid, with unhealthy skin and of strumous habit.

Other remedies that will be required in special cases are *Arsenicum iodatum*, *Prorium*, *Conium*, *Mercurius iodatus flavus*, *Krookotum*, *Kali sulphuricum*, *Rhus tox.* and *Argentum*.

CHAPTER CV.

INTERSTITIAL KERATITIS.

General Considerations—Symptoms and Course—Treatment.

General Considerations.—Interstitial keratitis is a type of inflammation confined almost exclusively to early childhood, in which the cornea becomes thick and hazy and generally opaque without ulceration. Its blood vessels are enlarged and the inflammation is diffuse. This type of keratitis is known also as parenchymatous, strumous or "scrofulous" keratitis, and by most authors is also described as syphilitic keratitis. This classification goes to show that it is considered due to inherited syphilis or struma in many cases. It is also an accompaniment to lithemic invasion

and rheumatism. It is rarely if ever observed in children of robust constitution and genealogy.

Symptoms and Course.—The initial symptoms of diffuse keratitis are slight corneal conjunctivitis, quickly followed by the appearance of small spots of infiltration in the cornea, these gradually extending until the whole structure is diffusely hazy, having more or less completely lost its transparency. In other cases the opacity may begin with one or two small spots near the margin and spread to the center. As the haziness extends the infiltration to which it is due is greatly increased, the entire structure of the cornea being invaded. Blood-vessels form in the layers of the cornea, giving to it a peculiar vascular appearance from which the name vascular keratitis has sprung. As the disease progresses the child experiences considerable pain and sensitiveness to light. The eye has a peculiar, watery appearance and lachrymation is increased. Iritis, and even inflammation of the deeper structures of the eye, occurs during the course of this type of keratitis, especially if of syphilitic origin.

As may be imagined, the course of diffuse keratitis is essentially chronic and the sight is materially impaired. Fortunately it is often the case that but one eye is affected, though within a few months or a year the other is very likely to become involved unless the constitutional state that is the cause of the trouble be successfully combated.

Within a few weeks from the first appearance of the diffuse blotches that are the initial observable signs of interstitial keratitis the cornea becomes so opaque that the iris is no longer visible, becoming so diffusely infiltrated as to present a ground-glass or frosted appearance. Unless the iris is affected the pain is usually insignificant, though there is present a sense of discomfort because of the swelling of the cornea and the sympathetic lid-involvement that are factors of the case. The opacity varies in density over different portions of the cornea, as does also the formation of new blood-vessels. Under a glass of low power these are plainly to be seen ramifying in all directions, forming a perfect vascular network. They are also observable to the naked eye, the cornea presenting a beefy appearance in severest cases because of the increased size and number of the blood-vessels.

Treatment.—The treatment of interstitial keratitis will have to be directed chiefly towards its cause. If constitutional syphilis be at its base medication will have to be selected accordingly. If the child is of strumous diathesis it will need such remedies as *Cathartica carbonica*, *Calcarea phosphorica*, *Hepar sulphur*, *Graphites*, *Kali carbonicum* and *Sulphur*. If rheumatism be apparently the cause of the trouble *Rhus tox.*, *Colchicum*, *Mercurius*, *Arsenicum*, *Sepia*, *Nitric acid*, *Pulsatilla*, *Kali muriaticum* and other remedies suited to the rheumatic state will be found most useful.

If of syphilitic history *Thuja*, *Sulphur*, *Parinum*, *Mercuro*, *Kali hydriodicum* and *Jodum* may be needed. *Arsenicum* is especially applicable to interstitial keratitis with greatly increased marginal vascularity in debilitated subjects in whom photophobia is pronounced, and in whose cases there are nightly aggravations, especially after midnight, with burning, itching and irritation of the corneal surfaces.

Mercurius vivus will be required for the severe nightly pains, with intense injection of the cornea and general infiltration and acrid tears.

Sulphur is indicated in the typical *Sulphur* subject with diffuse keratitis attended by ill-defined symptoms not yielding readily to apparently well directed remedies. The system is at fault, the history of the case being that of psora or struma. *Sulphur* is especially applicable in keratitis resulting from suppression of eruptions upon the skin or scalp, as also when dependent upon suppressed glandular discharges.

Hepar will be found helpful when there is exquisite sensitiveness of the eyes to touch or light, with discharge of thick, yellow matter, and dense opacity over large areas of corneal tissue.

Kali muriaticum assists in clearing up the field of vision when the infiltration is extensive. There is intense photophobia with more or less pain and beefy redness of the cornea.

Aurum muriaticum will be helpful in syphilitic keratitis. The history is clearly that of hereditary syphilis. There is diffuse infiltration with only moderate sensitiveness of the eyes to light, and pain of a dull aching character of the entire orbit.

Nitric acid is another remedy of value in syphilitic keratitis, with nightly aching of the eye, profuse, acrid tears, dense opacity and a tendency to superficial ulceration.

Mercuro, *Sulphur*, *Thuja*, *Graphites*, *Calcarea* and *Silica* will be required in special cases. The latter remedy is more especially applicable when there is dense haziness over the entire cornea.

Rhus tox., *Mercuro*, *Gelsemium*, *Conium* and *Belladonna* will be needed in rheumatic keratitis with iritic inflammation. *Rhus* is especially demanded in nightly aggravations with deep, boring pain and restlessness.

Local applications are of no value in diffuse keratitis, unless it be that atropia is needed where the iris is secondarily inflamed. It may be required for the purpose of dilating the pupil and thus avoiding adhesions, at the same time giving relief from pain by overcoming the intra-ocular tension.

CHAPTER CVI.

OPACITIES OF CORNEA.

General Considerations—Treatment—Medication—Iridectomy—Tattooing.

General Considerations.—Ulceration of the cornea, whether large or small, is followed by more or less of opacity, depending upon the nature of the ulcer, the character of the disease of which it is a symptom, and the degree of diffusion or infiltration that surrounds the ulcer. In mild cases it may be mere haze or nebular spot, observable only upon close examination and not materially disturbing the vision. In other cases it appears as a white, clearly defined spot or macula, while in the severest types of the disease white scars covering considerable areas of corneal surface are observed. This latter type of opacity is termed *leucoma*.

If opacities occur directly over the pupil they interfere with the vision in proportion to their extent and density. When occurring at the margins of the cornea, or not directly over the sight, they are not so apt to interfere with the reception of light, but may produce more or less squinting. If large abscesses or if a number of abscesses have formed in the layers of the cornea, causing rupture, the anterior portion of the globe may be bulged forward (*staphyloma*) and its entire aspect be so befogged that sight is completely excluded. Care must be exercised in making diagnosis of opacity not to confuse it with pus in the anterior chamber (*hypopyon*) this always being observed at the lower anterior margin of the cornea, the pus sinking to the floor of the chamber. Very dense opacities must also be differentiated from plastic inflammation of the membrane of Descemet.

Treatment.—Opacities may be cleared up by the continued use of homeopathic remedies in a considerable per cent. of all cases observed. Especially in young subjects, where the scar is not very dense and where the opacity consists of nebular haziness, the action of *Calcarea*, *Silica*, *Sulphur*, *Fluoric acid*, *Hepar sulphur*, *Graphites* and *Kali muriaticum* will be found satisfactory.

LOCAL APPLICATIONS.—These are of little, if any, avail. Among others that have been recommended are nitrate of mercury, loric acid and sulphate of soda, these being applied by means of a small cotton swab directly over the opaque spot once or twice daily. It is not believed that treatment of this character will be efficacious. The best results are unquestionably obtained from the long continued use of *Silica* or *Calcarea fluorica*.

IRIDECTOMY-TATTOOING.—Operative measures that have sometimes been resorted to in very dense opacities are the performance

of iridectomy for the purpose of forming a new pupil opposite the point in the cornea that is not opaque. For cosmetic purposes ugly opacities have been tattooed with India ink, the ink being spread over the opaque part of the cornea, this structure being submitted to a process of pricking with fine-pointed needles in order that the ink may be embedded in the opacity.

CHAPTER CVII.

IRITIS.

General Considerations—Symptoms and Course—Treatment—Medication.

General Considerations.—Iritis is an intensely painful affection not often observed in children except in connection with diffuse keratitis; yet it may occur in subjects of rheumatism quite independently of keratitis, and may even set up as an idiopathic inflammation. Children are born with complete occlusion of the pupil, or with synechia, showing that the infant has been the subject of congenital iritis. In syphilitic infants it occurs during the first twelve months of life with great frequency, and in subjects of infantile rheumatism it is also witnessed in all early ages.

Iritis rarely occurs without inflammation of the ciliary body, and without congestion of the choroid coat and a deposit of lymph upon the posterior layer of the cornea, resulting in adhesion between the structure and iris.

In typical cases of syphilitic keratitis iritis is always a severe accompaniment unless atropia be instilled in the eye to keep the iris well away from the cornea. Even this measure is not always effective, the iris and ciliary body being inflamed from the same causes that operate to set up interstitial keratitis.

Symptoms and Course.—Iritis is an exceedingly painful affection. The pain is deep-seated, of a sharp, lancinating, excruciating character, always worse at night, aggravated by changes in the weather and by the presence of bright light. Photophobia is an ever present symptom. The eye is more or less suffused, there is discoloration of the iris, sluggishness of the pupil, and more or less peri-corneal injection. Attachments are prone to form between the papillary margin of the iris and the capsule of the lens, and also, as already stated, occur anteriorly from a serous deposit that agglutinates the iris and cornea.

Besides rheumatic and syphilitic iritis inflammation of the iris is occasionally observed in tubercular subjects; it is also seen as the result of injuries, as blows on the eye, or bruises received from falling, and the like. In very rare cases of syphil-

itic history there is observed a gummatous iritis, and in the infectious fevers purulent iritis is witnessed, especially in connection with purulent keratitis.

The characteristic symptoms of iritis are the excruciating pain and the sluggishness or immobility of the pupil, its failing to react to light, or acting slowly and perhaps very irregularly. In severest cases the pain extends from the orbital region to the temple on the affected side and to the root of the nose. In others there are sharp, lancing, stabbing pains in the brain, experienced on the top of the head and even at the base of the brain.

Treatment.—The treatment of iritis is both constitutional and local. In no case of inflammation of the iris should the use of atropia or other mydriatic be locally neglected. It is absolutely necessary that the iris shall be kept away from the anterior surface of the lens and the posterior surface of the cornea in order that adhesion shall be avoided. The only exception to this rule is in serous iritis where there is considerable deposit of lymph with consequent increase of intra-ocular tension. Hot compresses to the eyes and temples are sometimes very soothing. These should be kept up interruptedly, just as hot as the patient can bear them, during the acute manifestations of pain, with more moderate application of heat not so oft repeated when the pain is less. If the corneal injection be pronounced it may be well to add hamamelis to the hot water, applying this as occasion demands.

Mercuriation.—Internal remedies should be administered according to the nature of the case. If it be strictly of syphilitic origin there is no better remedy than *Mercurius solubilis* or *Mercurius vivus*. These remedies have mighty aggravations of pain in the eyes, of a deep aching or stabbing character, with suffusion of the eyes and a muco-purulent discharge. *Mercurius* is especially indicated if inflammation of the iris is observed in association with syphilitic keratitis.

Rhus tox. should supplant *Mercury* for severe nightly pains when of rheumatic origin. All changes in the weather aggravate the suffering.

Belladonna will be found beneficial in throbbing, pulsating, congestive pains, the cornea being injected, the eyes hot and dry, the temples throbbing, the pain intensely aggravated upon the admission of light. For the severe photophobia of the eye troubles of children there is no better remedy than *Belladonna*. It will be especially applicable when atropia is being used locally.

Gelsemium is an excellent remedy for iritis with intense pain at the base of the brain and in the temples. There is fever, with full, bounding pulse, the skin is hot, but moist, the pain about the eyes is intense, the globes being full, distended and throbbing.

Acute will be found especially helpful in acute inflammatory iritis coming on idiopathically, with sharp fever, hot, dry skin, thirst, restlessness, lancinating pains in the eyes, which are either dry or suffused, the child being hyperæsthetic and intensely nervous and restless.

Iscaryon viride is also indicated in idiopathic inflammation of the iris with full, bounding pulse, moist skin, congestive symptoms about the head and eyes, with a tendency in very young children to cerebral congestion and spasms.

Colchicum is occasionally demanded in rheumatic iritis, and *Nitric acid* will be found helpful in subjects of both syphilis and rheumatism with nightly aggravations of pain. If the iritis be a part of diffused keratitis *Sulphur*, *Calcarea carbonica*, *Kali carbonicum*, *Graphites*, *Thaps* or *Psorinum* may be demanded, especially as effusion and synechia occur.

Bryonia is a rheumatic remedy of prime value in iritis with serous effusion. The patient is worse from light, noise and jarring of the bed, slamming of the doors and other shocks. The pain is worse at night, and the headache is intensely aggravated by motion. Early immobility of the pupil indicates adhesive inflammation.

Arsenicum iodatum will occasionally be called for to promote absorption of effused lymph, especially in the combination of diffused keratitis and iritis.

The secret of success in the treatment of inflammatory iritis is the ascertainment of the constitutional symptoms upon which it is engrafted and the direction of treatment toward the constitution and temperament of the child, rather than the local state. In acute idiopathic iritis remedies prescribed with especial reference to the condition of the eye will be found most beneficial; but when the eye disorder is dependent upon syphilis, rheumatism or struma, or in any sense the result of metastasis, the deep-acting constitutional remedies directed toward the dyscrasia that is responsible for the iritic inflammation will be found most helpful and curative.

CHAPTER CVIII.

BLEPHARITIS MARGINALIS.

General Considerations.—Symptoms and Course.—Treatment.—Medication.—
Local Applications.

General Considerations.—Strumous children are subject to chronic inflammation of the margins of the lids with the formation of scurfy scales thereon, causing itching and irritation, with falling of the hair and hypertrophy of the edges of the lids. In many cases blepharitis marginalis is dependent upon conjunctivitis primarily, whereas in other cases the condition is purely a local one, being in no sense connected with the ocular apparatus.

Symptoms and Course.—The edges of the lids show slight irritation, causing the child to rub and scratch them, thus increasing the trouble. Dry, furfuraceous scurfings form at the roots of the hair and upon the edges of the lids, these scaling off upon rubbing or scratching, sometimes clinging tenaciously to individual hairs. The lids show some redness and inflammation, and after a time become hypertrophied at their edges so that simple degrees of ectropion eventually follow. Children who are otherwise attractive and in the full enjoyment of health are often rendered unsightly from marginal inflammation, the entire length of the edge of the lids being occupied by thick yellow crusts. This ailment is generally dependent upon struma for a cause. Its course is occasionally interrupted by the formation of styes, though as a rule the only observable symptoms are the incrustations that occur at the roots of the hair, the slight thickening of the lids, increased redness of their margins, and the itching and irritation that the child experiences.

Treatment.—Blepharitis marginalis requires *Arsenicum*, *Graphites*, *Hepar sulphur* and, especially, *Calcarea*. The latter remedy administered once or twice a week in medium potency will often promptly cure a chronic blepharitis.

Graphites will be demanded if the crusts are unusually thick and heavy and of a sulphur color.

Kali muriatum will be called for if the meibomian glands constantly exude a sticky secretion.

Sulphur will be curative in inveterate cases which resist other remedies, the child being a typical sulphur subject.

Thuja may be occasionally required in children of syctic taint.

Rhus tox. will be helpful where there is intense itching of the lids with nightly agglutination, the edges of the lids being almost eczematous.

Asiaticum will be found helpful in anemic children with chronic inflammation of the lids, whose edges are hypertrophied and covered with dry, scurfy scales.

LOCAL APPLICATIONS.—In addition to the constitutional remedy that will usually clear up the case it may be necessary to use some bland preparation for the lids for the purpose of softening the scales and thus relieving the mechanical irritation of their presence. For this purpose lanoline, cold cream, calendulated vaseline or other simple unction will suffice. It is not wise to apply lead or zinc ointment, as is quite the rule in domestic practice. Unusually inveterate and stubborn cases should be sent to the nearest oculist.

CHAPTER CIX.

STYES.

General Considerations—Symptoms and Course—Treatment—Local Remedies—Medication.

General Considerations.—Hordeolum, or styes, are minute boils or abscesses that form upon the edges of the lids, their site being the meibomian glands and the connective tissue of the lid. They are really a type of furuncle and it is believed are due to infection of a hair follicle or meibomian gland. They occur in crops or singly. In individual cases there may be a dozen or more styes extending over a period of weeks or months, showing more or less systemic disturbance, though it is not impossible that all the rest may depend upon a single infection. It has been suggested that a course of styes is due to the introduction of a mycelium into the blood. It is not unlikely, since they are usually engrafted upon the strumous base, that there is more or less auto-infection as an operating cause. Independent of all causes of this character, however, styes occur as a result of bruising due to vigorous rubbing of the lid during the course of blepharitis marginalis, and are also seen as the result of eye-strain with considerable associate irritation of the lids.

While observed most commonly in children they are also common to adult life. They are especially likely to occur in young subjects who are anemic, in young girls at the approach of menstruation, in dyspeptic subjects, and in youths whose systems are below par, from whatever cause.

Symptoms and Course.—The symptoms of styes are not very different to those of small boils elsewhere. A slight irritation will be observed at the margin of the lid, being followed by a minute point of inflammation, attended by itching and pain. The tissues surrounding become infiltrated and swollen, in pronounced cases so much enlarged as to quite disfigure the subject. If located directly on the tarsus there may be a good deal of pain of a throbbing, aching character. If the connective tissues be more affected swelling is apt to be out of proportion to pain. After two or three days of inflammation a fine yellow point is observed at the center of the styte, which opens at this site, discharging a small quantity of pus, after which healing takes place with slight hypertrophy of the tissues upon the site of the styte, lasting over a period of two or three weeks before it is altogether dispersed. There is nothing characteristic about the styte to differentiate it from a small furuncle elsewhere, and when occurring in crops it pursues about the course that is observed in successive crops of small boils.

Treatment.—The treatment of styes is local and constitutional. The application of cold or heat, as is best borne by the child, as the styte develops will be found to be grateful. If suppuration is inevitable the styte may be poulticed to hasten the discharge of pus in cases in which it is not deemed advisable to use the lance. Large styes should be incised early, in the line of the grain of the integument, care being exercised not to incise the tarsal cartilage. The local application of the tincture of *pulsatilla*, *Thuja*, or *hamamelis* will occasionally abort a styte, especially if the indicated internal remedy be used at the same time. I am very sure that I have aborted these pests more than once by the local application of tincture of *pulsatilla*, though it is by no means a cure-all.

Medication.—Remedies that will be found especially beneficial in styes are *Pulsatilla*, *Thuja*, *Staphisagria* and *Sulphur*.

Pulsatilla is almost specific in styes occurring in light-haired, blue-eyed, lymphatic subjects. Styes upon the upper lids with excessive inflammation, that suppurate easily, and that are not especially painful are relieved by *Pulsatilla*.

Staphisagria is the remedy of remedies for crops of styes extending over a period of several weeks. One styte is hardly well when another appears. This remedy is especially useful in styes occurring as a result of nervous exhaustion.

Graphites will be required in styes that are painful, though not especially so, to the touch and that discharge thick, yellow matter.

Hepar sulphur is especially needed when the pain is of a throbbing character, the styte being exquisitely painful to touch or pressure, the child shrinking from all local treatment because of the suffering it causes.

Thuja will also be helpful in sycotic subjects with successive crops of sluggish styes.

Sulphur and *Calcarea* will be useful in hordeolum occurring in strumous children bearing the general characteristics of these remedies.

Aconite and *Belladonna* will be indicated during the height of the inflammation, when the stye is exceedingly painful, the child hot and feverish, with stabbing, sticking, throbbing pains in and about the hordeolum.

Apis will be required in especial cases where there is a great deal of infiltration and edema of the lids, the pain being of a biting, burning, stinging nature.

Arsenicum should be administered for successive crops of styes occurring in anemic, debilitated subjects, especially when following typhoid or other continued fever or debilitating disease.

SECTION XL

DISEASES OF THE EAR.

CHAPTER CX.

ACUTE AURAL CATARRH.

General Considerations—Symptoms and Course—Treatment—Local Treatment.

General Considerations.—Acute catarrh of the middle ear, or *otache*, is a very common ailment of infancy. A great many children are treated for colic, gastralgia and other abdominal pains when they are really suffering from acute catarrh of the middle ear due to cold or local infection. Acute simple inflammation originates in a large proportion of cases in the nasal passages, the inflammatory process extending up the Eustachian tube. In other cases it is set up by the presence of water, especially soapy water, in the middle ear, from carelessness on the part of the nurse in bathing the infant. In other cases it is unquestionably neuralgic in character, due to careless exposure of the child to drafts of air during the sleeping hours, while being bathed, or, perhaps, to exposure to sharp winds while being carried in the fresh air. *Otache* is also a common attendant upon the eruptive fevers of childhood and upon faucial and tonsillar inflammation. During the process of dentition it is excited by sympathetic inflammation of the auditory nerves, and in children who are suffering early decay of the teeth may occur from infection from this cause. Nasal catarrh in young subjects is also the cause of acute inflammation of the middle ear, and it goes without saying that the syphilitic dyscrasia predisposes in this direction.

Symptoms and Course.—It is often very difficult to determine the existence of acute middle ear catarrh during the earlier months of infancy. The child gives evidences of severe pain without being able to tell of its location. This is usually worse at night, in itself a diagnostic symptom of considerable value. Children who are suffering acutely from *otache* often refuse to take the breast, or after nursing for an instant let go the nipple and cry from severe pain, this being aggravated by the muscular movements of the jaws incident to the act of nursing. In many cases it is possible to make a diagnosis of *otache* only by a process of

exclusion, and not infrequently it is only by directing remedies toward the relief of earache, or by the effect of the application of heat or anodynes in and about the ear, that the location and nature of the suffering may be determined. Careful examination with the finger-tips about the external meatus and below and behind the ear may reveal local heat that will assist in determining the site of the pain. In other cases the attitude of the child's head will give the physician a clue, it preferring to hold its head to one side, and perhaps snugly to the breast of the nurse or mother because of the comfort experienced from the heat imparted from the human body. There is nothing pathognomonic in the appearance of the ear, as a rule. In special cases the auricle may be reddened and swollen, the canal being partially or completely closed. In other cases the pain is located altogether in the middle ear, and because of the shape of the canal and its smallness it is impossible to gather local data of value.

There may be a good deal of local congestion over the entire ear from compression and closure of the walls of the Eustachian tube. When this occurs, and especially if serous exudation follows, there may be stupor, even coma, convulsions and other evidences of cerebral involvement before attention will be directed to the ear as a cause of the illness. The possibility of the existence of acute inflammation of the middle ear should ever be borne in mind by the physician in treating crying infants. In more than one case the author has failed for a number of days to properly diagnose the trouble, to the manifest detriment of the little sufferer. Careful inspection of the ear should be made in every instance. The very tenderness of the parts and the unwillingness of the infant to submit to manipulation about the auditory meatus will often enable the examiner to make a diagnosis. In every case the relief that obtains upon the application of dry heat, or local lotions within the ear, or that follows upon the exhibition of remedies prescribed upon the hypothesis that the child is suffering earache, will make the diagnosis clear.

Treatment.—Earache is a very painful affection and calls for the exhibition of remedies that act quickly. *Aconite*, *Ferrum phosphoricum*, *Dulcamara*, *Belladonna*, *Gelsemium*, *Chromomilla* and *Pulsatilla* will cover most cases.

Aconite will be required if the child has taken cold, is feverish, hot, dry and restless, and if the ear and adjacent tissues give evidence of local heat and inflammation.

Belladonna better suits the congestive variety, the pain coming on in paroxysms, the hands and feet being cold at the time the child is suffering most, its head meanwhile being hot, with the face alternately pale and red. The pupils are dilated and cerebral symptoms are manifest in the typical *Belladonna* case, the right side being most commonly affected.

Chamomilla is a remedy of prime value for earache, the child suffering agonizingly. It is exceedingly restless, wants to be carried all the time, resting the affected ear against the nurse because of the relief that comes from heat and the support that obtains from pressure against her. If odd enough to manifest vehemence and irritability the child is cross and peevish, even uncontrollable, *Chamomilla* is applicable to the hyperæsthetic infant who suffers excruciatingly.

Gelsemium is very like *Belladonna*. The pain comes on in paroxysms and the inflammatory process excites cerebral symptoms, threatening convulsions, even meningitis.

Aptis will be required if the ear is hot and painful with a good deal of edema surrounding the auricle, the child uttering piercing, shrieking screams because of the nature of its pain.

Mercurius vivus is valuable in earache in connection with the process of dentition, and in nightly attacks of earache, the pain being worse in the middle of the night, not spasmodic as with *Belladonna*.

Pulsatilla is among the best remedies for earache in blonde children and lymphatic subjects. The patient cries bitterly with pain, which is so severe as to weaken and prostrate it.

Dulcamara has earache worse at night. Extreme sensitiveness to cold, damp air, worse from this cause. Acute catarrh of the middle ear arising from exposure to damp weather.

Capricorn is an excellent remedy for earache. It has otitis with heat and painfulness in the mastoid region. The petrous portion of the temporal bone is sensitive to the touch. The ears are very hot and if the child is old enough to express itself it complains of sharp, lacerating pains.

Ferrum phosphoricum will be required for dull aching with humming and roaring sounds in the ear from congestion and oncoming inflammation. The pain is not as acute as with *Acute*, nor is there the intense heat and restlessness.

Magnesia phosphorica excels in the typical neuralgic conditions of the ear, and is also an excellent remedy for the acute, spasmodic pains of middle-ear catarrh. It will often give relief where *Chamomilla*, *Pulsatilla* and *Belladonna* fail.

Other remedies that may be required are *Rhus tox.*, *Plantago*, *Kali bichromicum*, *Cannicum*, *Hepar sulphur*, *Arsenicum* and *Gnaphalium*.

LOCAL TREATMENT.—It is not usually best to apply local remedies in the earache of infants. Dry heat by means of hot, dry flannel cloths are comforting. Other dry-heat applications that have been used with benefit are bean, salt, the Japanese peck stone, and the continued application of dry heat by means of a hot stone sancer or other suited substance wrapped in flannel and kept pressed closely against the affected side. Hot liquids are objec-

tionable as a rule. In special cases plantago, hamamelis, calendula and eucalyptus may be applied locally by means of the eye pipette. The practice of using landanum or other preparations of opium in the ear, or of cocaineizing the canal, is pernicious, and should be proscribed. Sedative lotions very often benumb the sensibilities of the infant and thus deceive the nurse or physician into the belief that improvement is occurring when, as a matter of fact, the inflammatory process is going on unchecked, too often to a dangerous degree, during the stage of quiescence thus secured.

CHAPTER CXI.

SUPPURATIVE AURAL CATARRH.

General Considerations—Symptoms and Course—Treatment—Medication.

General Considerations.—Acute otitis media suppurativa is not an uncommon result of acute middle ear catarrh; in fact it is generally held that the latter condition always precedes suppurative inflammation of the middle ear, and that it is but a secondary stage of the former. Acute middle ear catarrh is so often observed without going on to suppurative inflammation that it becomes necessary to consider the suppurative affection as an altogether distinct ailment. It cannot be held that catarrhal inflammation that is characterized by the discharge of pus is always preceded by acute middle ear inflammation of the nature of that described in the previous chapter, though perhaps the majority of cases, certainly a large number of the cases, of suppurative inflammation of the middle ear occur with suffering and inflammation preceding. While not uncommonly the result of an acute inflammatory process bearing the name of acute middle ear catarrh yet the suppurative variety is so often secondary to acute exanthematous fevers and other infective processes that it is by no means correct to assert that it always has this separate and distinct acute state, this occurring, in fact, in a small proportion of cases of suppurative inflammation of the middle ear. The trouble usually comes on insidiously without inflammatory history. When seen in association with scarlet fever, measles or other acute disease it may be preceded by a slight history of pain and febrile reaction, but it may occur without the slightest evidence of ear suffering, the condition of the patient being in no sense attributed to the ear until discharge of pus is observed.

Symptoms and Course.—Suppurative inflammation of the middle ear is a very common attendant upon scarlet fever, this being accounted the most frequent of its causes. Next in order

comes measles, and third in point of frequency is diphtheria. It is observed most frequently in strumous children, the typical glandular subjects, and is often seen in association with enlargement of the glands of the neck and throat. Local ear catarrh of infective character is resultant also upon folliculitis tonsillitis. In fact, any infective process that may extend directly into the middle ear through the Eustachian tube, as well as via the lymphatic route, may excite suppurative destruction.

In many cases the pain in the ear is intense, the auricle is swollen and inflamed, the canal is so infiltrated as to be closed, the adjoining glands are enlarged and tender, the bony tissues surrounding the canal are sensitive to pressure, and very often the child has difficulty in swallowing because of the pain the act of deglutition causes, and because of the inflammatory process that is present in the throat as a primary condition. There may be headache and fever, nausea, slight rigors and a general condition of malaise and debility. If occurring during the course of scarlet fever, measles, diphtheria, typhoid fever or other zymosis the ear trouble may come on so insidiously as to be unobserved until pus is discovered in the canal. In strumous subjects this is more likely to be the course of the disease, but in nervous children the pain is apt to be more intense even than in acute catarrh of the middle ear unattended by destruction of the drum-head and suppurative discharge.

The presence of pus in the canal always indicates perforation of the drum-head. The rupture may be of pin-point calibre, or there may be two or three small openings in the drum, while in other cases the destruction is so extensive that the membrana tympani is completely destroyed. With the appearance of pus, especially if there be considerable outflow, there is relief from ear-ache; whereas if the discharge is checked externally there may be fresh outbreaks of pain and inflammation, the two conditions, those of inflammation and suppuration, alternating and occurring intermittently.

The course of acute suppurative inflammation of the middle ear extends over a few days or a week or two. Under proper internal medication, perhaps combined with local measures for purposes of cleanliness to stimulate healing of the drum, the case will be altogether cured. In strumous children, and when a part of the course of scarlet fever or other zymosis, the tendency is for the trouble to become chronic, gradually lapsing into a confirmed disorder that is difficult to cure and likely to be attended by permanent impairment of hearing.

Treatment.—The treatment of suppurative inflammation of the middle ear to be successful will combine constitutional and local measures, the latter contemplating the thorough drying of the canal as often as pus is detected with absorbent cotton or other

sterilized absorbent material. Peroxide of hydrogen is useful for the purpose of dissolving away the pus and mucoid secretions, followed by the application of boric acid and sacrum lactis, equal parts, calcinated sacrum lactis or other similar dry preparation. The application of liquid agents is forbidden, with the exception of peroxide of hydrogen, which is used for the purpose of dissolving the abnormal secretions, with the result that a larger per cent. of recoveries is obtained and that a less proportion of cases of suppurative inflammation of the middle ear pass on into the chronic state. When necessary to cleanse the canal this had better be done with absorbent cotton applied on the ear probe, all manipulation within the canal being done with extreme gentleness and care. No longer should the suppurating ear be syringed. When necessary to use peroxide of hydrogen the child should lie upon the well side and equal parts of the fifteen volume strength and distilled water should be gently dropped into the canal from the eye pipette. If too dilute to secure proper cleansing the full fifteen volume strength may be resorted to. In every instance the canal should be promptly dried by absorbent cotton and protected from the air by general packing of the external canal or auditory meatus. As a rule it will not be necessary to insufflate the ear with any powdered medicament if it be properly treated by the administration of the well indicated internal remedy.

MEDICATION.—Suppurative inflammation of the middle ear will require *Silicic acid*, *Hepar sulphur*, *Calcarea*, *Fluoric acid*, *Mercurius vivus*, *Thuja*, *Calcarea carbonica*, *Calcarea sulphurica* and *Arsenicum*.

Silicic acid acts more promptly than almost any other remedy in decreasing the quantity of pus secreted and promoting healing of the drum-membrane. The child is delicate in constitution, has light hair and a tendency to perspiration of the feet and head.

Calcarea carbonica is very often the remedy in strumous children with glandular enlargement, the ear trouble being secondary to the glandular infiltration and suppuration. The child is a typical *Calcarea* subject, of lymphatic temperament, with scrawny limbs, open fontanelles and distended abdomen.

Hepar sulphur is the remedy where there is exquisite sensitiveness to touch, with discharge of pus yellowish-green in character, somewhat offensive and occasionally suppressed, with renewal of the inflammatory symptoms.

Fluoric acid is very like *Silicic acid* and is especially indicated in children of syphilitic dyscrasia, with nightly earache and protracted discharge of pus.

Graphites and *Kali muraticum* will be thought of in connection with copious, persistent discharge of pus that is excoriating and that excites eczematous eruption about the face and neck.

Thuja, *Sulphur*, *Porinum* and *Tuberculinum* may be needed for exceptional cases of syphilitic or tubercular history. *Pulsatilla* will be required where suppurative inflammation is the result of metastasis of an acute exanthem. *Mercuro* will be needed where there is nightly earache with thick, creamy, offensive and acrid pus. *Arsenicum*, especially *Arsenicum iodatum*, will be useful in cases tending to become chronic, with anemia and general debility. *China* is also to be thought of in this particular if the discharge is purulent and tinged with blood.

CHAPTER CXII.

CHRONIC SUPPURATIVE OTITIS.

General Considerations—Symptoms and Course—Treatment—Local Treatment—Medication—Diet and Hygiene.

General Considerations.—Chronic suppurative inflammation of the middle ear is among the commoner diseases of this organ in child-life. It is almost invariably a sequel to neglected middle ear catarrh that results in suppurative otitis, being more commonly observed as the outcome of scarlet fever in strumous children or perhaps as the result of measles, diphtheria, typhoid fever and other zymoses.

All of the factors connected with acute suppurative inflammation of the middle ear are operative in the chronic form of the trouble. It is most common in strumous or tuberculous children and in those in whom other dyscrasie are manifested. The causes are the same as are operative in acute suppurative destruction of the drum and catarrh of the middle ear, and the general course of the disease is the same except that it is essentially a chronic ailment. While in numerous instances it may manifest itself as a steady or continued suppurative process, with uninterrupted discharge of pus, yet in other cases there are intermittent outbursts of acute symptoms, the suppurative process being renewed from time to time, even when it has been supposed that it was cured.

Symptoms and Course.—The discharge of pus from the ear is the characteristic and almost ever present diagnostic symptom of chronic suppurative inflammation. If retained within the ear for a few hours or a day it is fetid, greenish, and sometimes acrid. If it shows sanguinous features it is more than likely that there is polypoid growth within the ear, or that the edges of the destroyed drum-membrane are the site of exuberant granulations. If the discharge is ichorous the bony tissues are probably affected.

Where the mastoid cells are involved the pus is more likely to be mucoid and stringy in character.

The discharge of pus varies, in some being so excessive as to necessitate the constant use of absorbent cotton and protective dressings, in others being trifling in amount. If the accumulation within the middle ear be considerable and irritating it often winds its way down into the Eustachian tube, causing offensive breath, foul taste and even resulting in expectoration of pus; the hearing is always more or less impaired, in inveterate cases being positively benumbed, depending upon the degree of perforation of the drum-head and other pathological processes going on within. In many cases an apparently positive degree of deafness is due simply to the blocking of the canal with pus, either liquid or inspissated, the hearing being gradually improved when this is removed and so long as the canal is kept clean. The membrane of the tympanum is almost invariably perforated, in severe cases being completely destroyed. The degree of affection of the membrane can be determined by properly cleansing the canal and examining the drum and middle ear under illumination. The characteristic present when perforation has occurred is the pinkishness of the mucous membrane of the middle ear, seen beyond the white margins of the perforated drum, the latter forming a frame work, as it were, for the pink setting beyond. In small perforations it is not always possible to determine their location or presence by sight, and inflation has to be relied upon. The Politzer bag is of service in this connection, the air being forced through even minute openings with a positive whistling sound; or, where this is not observable, the perforation is to be determined by the presence of an air current from within against the hand, or as shown by a feather held against the ear, or as experienced by the child if old enough to tell its symptoms.

As the name of the disease implies the course of chronic suppurative inflammation of the ear is essentially chronic, in some cases being uninterruptedly continued over a period of months or years, in other cases having intermittent aggravations and ameliorations with seasons of apparently complete cure. In perhaps a large number of cases the recurrence of suppuration from an apparently cured ear is due to the presence of septic bacteria. Within the bony cells this may remain passive for a period of weeks or months, only to develop and multiply under favorable conditions, again setting up middle ear discharge.

It is almost absolutely safe to assume that chronic otitis media is invariably due to sepsis, this occurring from neighboring lymphatics, from the posterior nares or throat via the Eustachian tube, or, in its first manifestations, being due to staphylococci or streptococci of acute exanthemata. It is not within the province of a work of this character to enter minutely into a discussion of the

causes and nature of infective otitis. Special works upon the ear should be consulted for further information in this direction.

Treatment.—Chronic middle ear discharge was formerly accounted among the almost certainly incurable affections of childhood. Under modern methods, however, it ought as certainly to be cured. Treatment should be directed toward absolute cleanliness of the affected tissue, the application of suited stimulating or healing medicament in proper form, and, of most importance, the administration of constitutional remedies that strike at the root of the trouble. If due to struma or occurring in strumous subjects all the local measures that may be used are unavailing without the administration of *Calcarea*, *Silicia*, *Graphites*, *Sulphur*, cod liver oil, petroleum emulsion, wholesome, nutritious food and general improvement in the personal hygiene and sanitation of the patient.

If due to syphilis or tuberculosis remedies will have to be administered with reference to these causative features. If caries or necrosis of the bones of the middle ear or of the bony walls of the canal is present treatment, both constitutional and surgical, will have to be directed accordingly. If occurring as a sequel to scarlet fever, measles, diphtheria, typhoid fever, small pox or other zymosis the fact should be ever borne in mind that the ear disease is simply a part of or sequence to the acute disease, and remedies administered in accordance with this knowledge. In other words, it is impossible to separate the middle ear from the constitution of the individual and his general anatomy and physiology. It is essentially a part of the whole system, and failure to promptly cure chronic middle ear disease is more often due to neglect to take into consideration the dyscrasia, temperament and constitutional idiosyncrasies of the patient than any other single cause.

LOCAL TREATMENT.—The use of the syringe has been the cause of the continuance of a great many cases of middle ear disease. It is all but impossible to properly drain the middle ear of fluids that have been injected therein, consequently dry treatments have been found to be much superior to medicated injections. Even for purposes of cleanliness it is better, as a rule, to carefully mop the ear with absorbent cotton, secured upon the end of a delicate probe, gently forced as far as possible without giving pain, the ear being carefully wiped of all retained pus. If it be not possible to properly cleanse the ear in this manner it is permissible to drop a few drops of peroxide of hydrogen from an eye pipette, the child lying upon its well side. This preparation quickly decomposes pus, epithelial debris and dry or liquid blood with which it comes in contact, fermenting them out of their recesses in an instant. It is the only moist treatment that is permissible and immediately following this application the ear should be gently wiped with absorbent cotton, being subsequently carefully packed

with this substance, absorbent gauze, or lint, for the purpose of securing drainage by capillary attraction. The success of treatment of chronic middle ear disease will depend very largely upon the degree of dryness and cleanliness that can be thus secured.

Local applications that have been found useful following upon thorough cleansing of the canal and middle ear are dry boracic acid, equal parts of boracic acid and sugar of milk, equal parts of sugar of milk and calendula, five per cent. of salicylic acid and sugar of milk, and similar impalpable powders. Where there is but a small amount of discharge but a small portion of the selected agent should be insufflated. Where the discharge is copious, showing a larger area of destruction of the tissues, the canal should be quite well filled with the selected medicament. Intelligence should be exercised in the use of these agents, since in some cases the pus and the dry powder employed form crusts that are irritating and but increase the trouble. In such cases the suited medicament may be applied in the form of medicated gauze, this being gently packed with the delicate probe as far down into the ear as is possible without producing pain or discomfort, the natural delicacy of the structures being ever borne in mind when this is resorted to. As a matter of course, it will never be permissible to so firmly pack the ear with gauze, cotton or powder that the auditory canal is completely plugged, thus preventing the escape of the pus as formed. All packing should be light and loosely applied.

In confirmed cases exuberant granulations occurring upon the edges of the perforated drum, or in the auditory canal just without the drum-head, may have to be removed by the direct application of suited escharotics, as nitrate of silver, chromic acid, bichromate of potash, carbolic acid, or other selected stimulant. It is not wise, however, for the general practitioner to undertake this line of treatment if an aurist be at hand.

MEDICATION.—Remedies that are especially beneficial in chronic suppurative inflammation of the middle ear are *Hepar sulphur*, *Calcareo carbonica*, *Calcareo sulphurica*, *Kali muraticum*, *Silica*, *Sulphur*, *Phosoric acid* and, in tuberculous subjects, *Psorinum* and *Tuberculinum*. In syphilitic children *Mercurius nitrous*, *Mercurum*, *Nitric acid*, *Kali bichromicum* and *Kronidum* will be found most helpful.

Calcareo carbonica is especially adapted to the suppuration of the middle ear as seen in strumous or glandular children with Monde hair, lymphatic temperament, chronic irritation of the lids, nasal catarrh, flabbiness of the muscular structures and generally non-resistant constitution. It is the typical *Calcareo* constitution more than special ear symptoms that will determine the selection of this remedy.

Calcareo sulphurica is especially to be considered in chronic suppurative inflammation following upon scarlet fever and other exanthemata.

Calcareo fluorica is a better agent than either of the preceding remedies when the symptoms point to caries of the ossicles or bony canal. Here it is a rival of *Silicia*. It is also to be considered in connection with syphilitic conditions of the ear. *Silicia* will be found applicable to confirmed cases, the periosteum or bones or both being carious or necrosed. The discharge is not profuse in the *Silicia* case but is persistent. The child has headache, it tires easily, its skin is transparent, it perspires readily about the head and neck, and is otherwise not robust. Like all the *Calcareas* *Silicia* has glandular enlargement, and, especially, glandular induration.

Hepar sulphur is more likely to be useful where the discharge is profuse, greenish and offensive. The ear is tender to the touch, the discharge causes eczema at the external meatus, and there is a disposition to boils, furuncles and styes and other unhealthiness of the skin.

Graphites is suited to the *Graphites* child. The discharge is thick and yellow, rapidly dries into yellow crusts in the external canal; eczematous inflammation is present in and around the auricle; the child may have been the subject of tinea capitis, or middle-ear disease may have followed upon the repression of an eruption on the scalp and neck.

Sulphur is required in exceedingly stubborn cases that fail to yield to apparently well indicated remedies. The child is averse to being bathed, its skin is shriveled, dry and wrinkled. The hair is unhealthy and the patient may have had tinea capitis, or other eruption on the scalp or elsewhere upon the body, the middle-ear disease depending in part at least upon its recession.

Mercurius will give relief from nightly suffering of chronic middle-ear disease when the bones are affected, whether from syphilis or other cause. The discharge is acrid, the external ear being kept sore therefrom.

Thuja for the syphilitic patient, *Psorinum* for the psoric infant, and *Tuberculinum* for children of tuberculous parentage should not be overlooked in inveterate cases.

Calcareo phosphorica may be required in children whose osseous development is slow and in whom dentition is retarded.

Mezereum and *Nitric acid* should not be forgotten in cases presenting a syphilitic history.

The properly selected homeopathic remedy is of unquestioned value in the treatment of middle-ear disease, though it must be borne in mind that it is not possible for the chosen medicament to clean and disinfect the tortuous recesses of the affected organ. Unless the ear be properly cleansed of pus and debris, especially

if the cause be of infective nature, as is the almost invariable rule, well selected internal medication will be valueless. The ear must not be allowed to remain in an unwholesome and infected state.

DIET AND HYGIENE.—Subjects of chronic middle-ear diseases will so often be debilitated by the acute infectious fever that has been the cause of the ear trouble that they will need supportive diet, fresh air, outdoor exercise, sea bathing, change of climate and the like. In many cases cod-liver oil, petroleum emulsion, Murdock's food, Bovinine, Proteinsol and similar dietetic preparations will be found necessary and very helpful. If sea bathing is resorted to the ears should be carefully protected by being so plugged that water will not find its way to the middle ear; so also in home bathing. If removal to the sea shore is not possible artificial sea bathing may be practiced at home by the use of evaporated sea salt. Nourishing food, fresh air, wholesome sleeping apartments, and favorable personal sanitation is absolutely demanded in all enfeebled children whose ears are suppurative. Otherwise, because of the general impairment of health that follows upon a failure to observe nature's laws, partial or complete deafness will be rendered more certain by continuing the middle ear disease until destruction of the ossicles or complete and permanent dissolvment of the drum has occurred.

CHAPTER CXIII.

CHRONIC CATARRHAL INFLAMMATION.

General Considerations—Symptoms and Course—Treatment—Medication.

General Considerations.—Children are often sufferers from a chronic catarrhal inflammation of the middle-ear that is not attended by the local symptom of suppuration. It is an exceedingly insidious ailment, characterized by more or less deafness, the result of the extension of catarrhal processes from the nares through the Eustachian tube. While these canals are ordinarily closed yet upon violent efforts at blowing the nose, yawning, sneezing and the like they are forced open, serving to ventilate the middle ear and equalize the pressure upon the tympanum. If they become permanently closed the residual air in the middle ear is eventually absorbed and a low grade of inflammation of the inner surface of the drum membrane is set up, resulting eventually in sclerosis of the tissues. While congestion of the auditory tract is witnessed upon illumination of the canal hypertrophy of the tissues within the middle ear occurs, this gradually becoming less mobile than normal. The drum hypertrophies and vibrates less

delicately than it should, and soon gradual, oncoming deafness is noticed. This is sometimes so insidious in children as not to be observed until it is quite confirmed, in many instances it being difficult to determine whether the trouble lies with the mentality of the child or its auditory apparatus. It is only as it is noticed that it pays no attention to usual sounds or fails to respond promptly to inquiries directed to it that the parents are made aware of the fact that the child's hearing is defective. There is hardly ever pain as a symptom, though at times when the child takes cold and in damp, raw weather the ear may be more sensitive than at other times, from increase in the degree of catarrhal irritation that is present.

Examination of the meatus and drum is negative except that under bright illumination it will be observed that the distended vessels are visible along the handle of the malleus, and that the drum is less transparent than usual as it becomes thickened.

Symptoms and Course.—Gradual oncoming deafness, with absence of pain and absence of suppurative discharge, the deafness being increased when the weather is damp and cold and whenever the child is suffering from manifestations of nasal catarrh, indicate catarrhal involvement of the middle-ear. Children who are subjects of this insidious complaint sometimes speak of singing or ringing noises in the ear; others suggest that there is a crackling sound upon swallowing; occasionally it is observed that there is a peculiar resonance of their own voices. The canal may be dry, even scurfy, though in rare cases there is an extra amount of moisture in the external canal with considerable secretion of cerumen. In some cases inveterate itching of the middle-ear, causing no little annoyance, is experienced. Children old enough to tell of their symptoms occasionally complain that the canal feels as though filled with water.

The course of chronic tympanic catarrh is essentially protracted, the disease altogether resisting treatment in a large per cent. of cases. It is especially observed in children of catarrhal tendencies, and while not accounted an hereditary ailment it is a significant fact that it is more often observed in children whose parents have been subjects of nasal catarrh and in whom deafness has been observed at some time during their lives. If allowed to go on uncured, or if treatment be ineffective, more or less permanent impairment of hearing is the result, adhesions of the ossicles and hypertrophy of the soft structures of the middle-ear eventually following.

Treatment.—The treatment of this ailment is essentially constitutional. It may be possible in some cases to assist in overcoming the trouble by properly dilating the Eustachian tube and practicing middle-ear inflation, thus preventing ankylosis and keeping the middle-ear supplied with residual air; but more often it is not possible to accomplish much in the way of local treat-

nient. The general hygiene of the patient should be improved in so far as possible and the health built up by constitutional remedies. Change of climate to Southwest Texas, New Mexico, the foot-hills of Colorado, interior points in California, or perhaps to Southern Georgia will be curative in very many cases of young subjects who are sufferers from nasal catarrh.

Local treatment of the pharyngeal vault and nares is usually more harmful than beneficial, though if these cavities be in an unwholesome state, occupied by catarrhal crusts underneath which septic fluids are retained, it may be necessary to resort to weak solutions of sulphite of soda, permanganate of potash, Dodel's solution, hydrastis, eucalyptus, calendula or other suited medicament for the purpose of rendering those parts aseptic and clean. Whenever it is necessary that local medication shall be employed it is better to use it in the way of vapor or nebular spray, rather than in the form of harsh injections of liquids, which usually prove irritating and thus increase the catarrhal inflammation. The old-fashioned posterior nasal syringe with which medicated fluids were injected with force into the ear is harmful and should be tabooed. Tenacious crusts are softened by liquid vasoline, lanoline or other oleaginous substance and may then be removed with the probe armed with cotton. If necessary a nebular spray of peroxide of hydrogen may be resorted to for the purpose of cleansing the nares and pharyngeal vault. These parts should be rendered as healthy as possible if the best results are to be obtained in treating the ear.

MEDICATION.—To be effective remedies will have to be directed largely towards the general state of the health, since chronic catarrh of the middle-ear is more often observed in catarrhal subjects, those who take cold readily, children who are non-resistant to atmospheric and other changes, and in whose constitutions are engrafted various dyscrasias that are in good part responsible for the ear ailment. Most often they are strumous children, who will require *Calcarea*, *Sulphur* or *Silica* as their basic remedy.

Artemium jodatum will be found curative in many cases of hypertrophy of the drum and other soft tissues, and *Sulphur* will often be effective in uprooting a dyscrasia that is behind the difficulty.

Kali carbonicum, *Pulsatilla*, *Mercurius*, *Mezereum* and *Tellurium* will meet the indications in special cases.

Aurum metallicum, while more especially required in suppurative inflammation, is sometimes useful in dry catarrh.

Graphites is especially applicable to dry conditions of the mucous membranes, these being opaque and thick, the Eustachian tube showing to be open upon inflation, the hearing not improving, however, upon its practice, this evidencing the fact that the middle ear is suffering the dry catarrhal state.

In *Tellurium* the membrane is corrugated and cicatrized, showing scars from perforation during the prevalence of suppurative discharge at some previous time in the child's history. *Phosphorus*, *Mercurius*, *Calcarea* and *Baryta* may occasionally be consulted to advantage, while in phthisical subjects *Iodum* is often the basic remedy that will set up improvement in the hearing.

The vibrometer has been extolled recently as a method of massage of the drum and ossicles that improves the hearing in dry catarrh, overcoming ankylosis and lessening the hypertrophy of the soft tissues. It is extensively used by specialists but will not be found to come within the resources of the general practitioner.

If the external canal is exceedingly dry and scurfy it may be found helpful to apply equal parts of glycerine and calendula or other selected bland medicament at night by means of the camel hair pencil. If it be thought desirable to medicate the middle ear direct it may be done in this manner or by charging glycerine with a selected medicament and dropping it upon the drum at night, allowing it to be absorbed. In a general way, however, the best that can be done for this type of deafness is to administer the well indicated constitutional remedy over a period of time, to cure the chronic nasal catarrhal state and to improve the general health of the patient by proper nourishment, exercise and change of climate.

SECTION XII.

SPECIAL SURGICAL DISEASES OF CHILDREN.

CHAPTER CXIV.

MICROCEPHALUS.

General Considerations—Operative Treatment—Education and Training—Medication.

General Considerations.—Microcephalus is a term used to indicate unnatural smallness of the head due to imperfect fetal or subsequent imperfect bony development. It is among the frequent causes of idiocy. Children are born with their skulls completely ossified, not open at the sutures or fontanelles. In other instances ossification takes place very soon after birth, the bones knitting firmly and their subsequent expansion and development being exceedingly limited, so much so that in special cases children of unusual bodily vigor are possessed of heads not more than one-half as large as they should be. The bones of the face are not usually involved in this lack of development or unusual early ossification, so that the child's jaws and face are much out of proportion to the size of its head. The forehead is flat, the cranium is small, there is apt to be an absence of symmetry of the two sides, and because of the firmness and smallness of the bony vault the brain is apt to be stunted and atrophied. Many idiots have perfect motive power while others are sluggish in all their movements and are the subjects of inco-ordination, epilepsy, chorea and athetosis.

Microcephalic children are idiotic usually in proportion to the degree of smallness of their heads. If ossification occurs before birth, or within a short while after birth, idiocy is pronounced. If, on the other hand, the fontanelles are slower in closing and a moderate degree of development of the cranium follows there may be imbecility, yet not complete idiocy.

Operative Treatment.—It is still an open question as to what per cent. of these cases are recoverable under craniectomy. If the case appears to be clearly one of early ossification of the skull, whereby the child's brain is stunted and not allowed to develop, being imprisoned in a microcephalic skull, it would seem to be reasonable that through craniectomy, whereby new sutures are

opened and the bony walls of the cranium kept apart to something like their normal position, the imprisoned brain might be developed and the child improved mentally. The operation is performed by first shaving the scalp and rendering it thoroughly or near aseptic. Suitable incisions are made through the scalp over the sutures and a button of bone is trephined away at one side of the anterior fontanelle, the Knoll raphe forceps (Fig. 75) is called into



FIG. 75.—Knoll's Raphe Forceps.

requisition. The lower blade of the instrument, which is narrow, yet strong, is introduced and made to cut its way parallel with the sagittal suture as far backward as its union with the occipital. It is then withdrawn and a new incision is made at right angles with the first parallel with and below the coronal suture. If necessary the process may be repeated on the posterior part of the skull,



FIG. 76.—"T" Incision for Microcephalus.

making the incisions to take of the character of the letter "H" rather than of the letter "T," as where the posterior incision is not demanded (Fig. 76). The point of the forceps-blade is so constructed that it can easily be made to plow a furrow through the microcephalic skull without injuring the dura mater, and thus, in cases where the parietal bones overlap and ossify, causing an asymmetrical skull, the suture that nature made may be readily imitated by a new suture. The rongeur punch forceps (Fig. 77), may be used to cut out sections of skull when necessary in these or other cases. When the

operation upon the bone is completed the scalp may be drawn over it and sutured with silk-worm gut, the wound being subsequently closed antiseptically and dressed in approved manner. If necessary the bones may be separated by being pressed apart within the limits of safety, and contrivances which will hold them apart may be brought into requisition.

If the microcephalic condition is altogether prenatal and the child's mentality was bad from birth it is not reasonable to hope for much improvement, the original lack of development in utero

having involved the brain as well as the bony structure. The microcephalic condition may, in fact, be altogether due to the partial absence of cerebral matter, the constriction and ossification of the skull being wholly due to the smallness of its contents, the membranous structure composing the tissues covering the brain before ossification has progressed to any considerable extent not being distended by the growth of the brain substance within. In these cases nothing is to be hoped for from craniectomy, while in chil-



FIG. 77.—Knell's Bistoury Pencil Forceps.

dren who are generally vigorous, who are possessed of reasonably large heads, and who show manifest evidences of intellect at two or three years of age it would seem that craniectomy should be resorted to in every case before the child is abandoned to hopeless idiocy. Under proper antiseptic precautions harm is not likely to be done to the little subject from a properly performed operation. Although the question is still *sub judice* yet it is not believed that the recommendation of operating on these cases, after proper explanation to the parents of the possibilities of failure of accomplishing the desired result, is too radical.

Education and Training.—Microcephalic children who are feeble minded yet possessed of a moderate degree of intelligence and are not accounted operable should in every case be submitted to skilled teachers, as in homes for the feeble minded for the purpose of developing their intellectual possibilities. It is not possible for the best results to be obtained under home surroundings. Whereas, in well conducted homes for the feeble minded very satisfactory results are often obtained. By no means should a child be abandoned either to hopeless or partial idiocy without resorting to the use of craniectomy in suited cases and skilled training and schooling in all others.

MEDICATION.—Naturally but little is to be done in the way of medication for microcephalic infants. If there be a constitutional dyscrasia behind the case, as psora, syphilis, tuberculosis or sycoosis, the exhibition of the constitutional remedy, as *Sulphur*, *Thuja*, *Calcarea*, *Psorinum*, *Tuberculinum*, *Calcarea phosphorica*, *Kali carbonicum* and similar remedies may assist in overcoming the operating cause, which may be continued to the child's detriment. If of paralytic nature *Zincum*, *Phosphorus*, *Aluminium* and other metals are more likely to be required.

CHAPTER CXV.

SPINA BIFIDA.

General Considerations—Diagnosis—Prognosis—Treatment.

General Considerations.—Spina bifida is a congenital malformation due to vertebral deficiency in the form of a protrusion of the contents of the spinal canal as a cystic tumor or sac composed of the spinal cord or its membranes. The deformity may occur at any part of the spine and in exceedingly rare cases may extend throughout almost the whole length. As commonly observed it occurs at the lumbo-sacral region, the laminae or spines of one or more vertebra being deficient. In exceedingly rare cases the spines of the vertebrae are divided, in which event the tumor will protrude laterally or anteriorly.

Spina bifida is divided into three classes, the first of which is meningocele, consisting of a protrusion of the dura mater and arachnoid, the sac containing only the membranes and cerebro-spinal fluid; the second, meningo-myelocele, being a protrusion of the membranes, cord substance and nerves; the third form is styled syngo-myelocele, consisting of a protrusion of the membranes and cord, the central canal of the cord being dilated to form a sac, the cord being thinned because of the distension it undergoes. The second classification given is the most common.

Hydrotrachis, or spina bifida, varies in size from the size of a walnut or Tanger orange to that of a cocoanut or child's head. For an excellent illustration of bifid spine occurring at the lumbo-sacral region see Fig. 1, Plate I.

Spina bifida grows rapidly during the early weeks of life. In some cases there is a definite pedicle where the tumor joins the body but in most cases it is sessile. At the base the integument is thick and heavy, while at the fundus it is often thinned or perhaps the only covering the cyst possesses is that formed by the spinal membrane itself. The spina bifida tumor is generally translucent, and careful digital examination at its base will reveal the margins of the bony aperture. Pressure upon the tumor causes increase of density at the anterior fontanelle, and if firm pressure be applied, especially if continued for any length of time, convulsions and stupor are likely to occur. Firm pressure upon the anterior fontanelle distends the tumor and causes it to be more resistant to touch.

Subjects of spina bifida are not usually in vigorous health. The condition is often associated with talipes, hydrocephalus and congenital malformations of the rectum or bladder, or paralysis of

either of these organs. It is a commonly fatal affection, though occasionally spontaneous cure through shrinkage of the sac is observed in meningoceles, and even in meningo-myeloceles. The third classification described, in which the thickened cord forms the walls of the sac, is invariably a fatal type.

Diagnosis.—The diagnosis of spina bifida is not difficult. In cases in which perfectly healthy integument completely covers the tumor it may be mistaken for other forms of congenital tumor, especially when located in the sacral region, as lipoma, teratoma, or hygroma. The two latter types of tumor are firm and resistant, being composed of solid substances, whereas spina bifida is a cystic tumor, being occupied largely by spinal fluid. Hygroma is more spongy and is not usually located in the median line, as is bifid spine. The central location of a tumor at whose base can be distinctly seen the edges of the opening, and whose fundus is covered by thinned integument, or perhaps only by spinal membranes, is in every instance a meningo-myelocele or hydro-rachitic tumor. In extremely doubtful cases it may be desirable to draw off a small portion of the fluid by means of a fine hypodermic needle. If intensely albuminous it is not bifid spine. The fluid contained within the cystic spinal tumor consists of ninety-eight parts of water with soluble salts and a trace of sugar. If a tumor not present at birth be observed in a child it is not spina bifida.

Prognosis.—This type of surgical disease of childhood is exceedingly fatal. Nearly all cases not brought under treatment result fatally from meningitis, due to rupture of the sac, or from marasmus. In vigorous children with small tumors spontaneous cure occasionally occurs, the sac shrinking and puckering in the form of a firm cicatrix. It is so often associated with various forms of paralysis that even if a satisfactory surgical cure be brought about the paralytic state still remains to affect the child's health deleteriously, or by pressure to destroy its life by marasmus or gradually progressive paralysis.

Treatment.—Spina bifida has been subjected to treatment by compression, by means of compress and bandage, the elastic bandage, adhesive straps and the application of contractile collodion. The cyst has also been tapped and drained off, has been ligated, cauterized, excised and treated by various injections. The ligature is almost necessarily fatal, even when the pedicle is small. Excision produces but little better results. Pressure cannot be continued sufficiently long with sufficient evenness to promote absorption of the fluid and produce shrinkage of the sac, because of the danger of exciting convulsions by increased cerebral tension. The only accepted methods at present in vogue are excision of the sac, it being treated very much as hernia elsewhere is treated, and the injection method. The latter consists in plunging a fine trocar obliquely through sound skin, little or no fluid being

drawn off, the sac being injected with Morton's fluid, made up of iodine, iodide of potash and glycerine, from fifteen minims to a drachm being injected at a time. This fluid consists of ten grains of iodine, iodide of potash thirty grains, glycerine one ounce. For repeated injections the quantity of iodine may be increased up to thirty grains to the ounce. The fluid should be injected through the skin and where it is thick, it being desirable to prevent the escape of the spinal fluid and to avoid injury to the nerves and cord. After injection the trochar is withdrawn and the puncture is sealed with gauze and iodoform collodion. In pronounced cases, where the tension of the sac is well defined, it may be desirable to withdraw some of the fluid before injecting the medicament. The child should lie upon its back during the operation, care being taken to prevent the passage of the injecting fluid into the spinal canal. Injections may be repeated at intervals of from ten to fourteen days if no ill effect follows the first injection, and if little or no shrinkage is produced.

Spina bifida is clearly the result of failure at ossific union of the lateral halves of the spinal column, and it is not believed that internal medication will prove of avail in this condition.

Remedies that may be administered for the improvement of the general health of the patient are *Arsenicum*, *Sulphur*, *Iodum*, *Baryta*, *Solina* and *Calcarea*, as indicated. For the scorbutic habit and constitution it may be well to rely upon *Sulphur*, *Thaya* or *Pyriusque*, as constitutional remedies. *Arsenicum iodatum* is more likely to assist in the absorption of the spinal fluid than any other remedy, in most cases. When resorting to the injection method it will be well to exhibit *Arsenicum iodatum* or *Iodum* internally.

CHAPTER CXVI.

CURVATURES OF THE SPINE.

General Considerations—Lateral Curvature—Forms—Symptoms and Course—Treatment—Mechanical Appliances—Antero-Posterior Curvature—Symptoms and Course—Treatment.

General Considerations.—Spinal curvatures are seen in four chief varieties, lateral, posterior, anterior and angular. The first variety, lateral curvature, is the scoliosis of the early authors. The second, posterior curvature, is commonly known as kyphosis. The third form, or anterior curvature, has long gone under the name of lordosis, while the fourth form, or angular curvature, has borne the latter name.

Curvatures of the spine are more commonly seen in the subjects of rickets and are doubtless encouraged by the normal curvatures of the bony column. These are four in number, the cervical, dorsal, lumbar and pelvic. The first named has a forward convexity; the second, or dorsal curve, has a forward concavity, its convexity being in the posterior direction; the lumbar curve is convexed anteriorly, and the pelvic curve is convexed posteriorly. The dorsal and pelvic curves, which are the primary and more positive curves of the spinal column, are due to the formation of the cavities of the chest and pelvis, and altogether depend upon the shape of the bones, while the cervical and lumbar curves are in good part compensatory, occurring after birth and as the erect posture is assumed.

Lateral Curvature.—Scoliosis is a lateral deviation of the spinal column. This most common variety is observed in youths oftener than in children. It is not seen with the same frequency before puberty as afterwards. In a large percent. of cases there is not only a lateral curvature of the spinal column but also rotation of the vertebra, with increase or diminution of the normal curves. As seen in children scoliosis belongs to rickets, and is also observed as the result of empyema and as an associate of a shortened lower limb. It is encouraged also by unnatural attitudes or positions at the desk in school, and is not infrequently seen to depend upon paralysis of one leg as it occurs in childhood. The condition is a compound one, rotation being an almost certain accompaniment of lateral curvature (Fig. 78). It is more common in girls than in boys, in children of scrofulous parentage and rickety habits, in subjects who are ill-nourished and whose lives are unhygienic, and is also more common to children who are book-worms and house-plants than to those who indulge in vigorous outdoor exercise. It occasionally follows upon the



FIG. 78.—Lateral Curvature of Spine with Rotation. (Wilson.)

debility or partial paralysis of muscles that is due to long continued attacks of illness, especially typhoid fever and is also observed as a natural consequence of the distorted faces assumed in chronic empyema and other diseases of the chest.

Scoliosis occurs as a congenital malformation from unevenness of development of the vertebral bodies; from congenital deficiency in the limbs of one side, whereby the normal action of the muscles and the weight of the limbs are unbalanced; from shortening of one leg from whatever cause; from imperfect development or sink-

ing in of the chest wall of one side; from muscular and ligamentous weakness, combined with confirmed faulty attitudes, and from rickets and caries of the spine in which one side of the bodies of the affected vertebrae is diseased.—(Sutton.)

The larger number of cases are of the acquired varieties. A common operating cause is an unnatural habitual position in which infants are carried, as shown in Fig. 79. Here it will be observed the pressure is all thrown upon one hip and the spinal column is deflected to the right. It should be borne in mind that in the early months of child-life, during which the infant is in the nurse's arms a good share of the time, unequal pressure is applied in one direction over a good many hours each day. This cannot but have its influence in directing the development of the vertebrae. Faulty positions at school that produce scoliosis are shown in Figs. 80 and 81, from Hoffa. Youthful violin players encourage the habit of scoliosis by the position they assume in pursuing their vocation, and children who are early made



FIG. 79.

beasts of burden, carrying heavy loads upon one shoulder or by one hand, are subjects in whom lateral curvature is likely to be observed.

FORMS.—Lateral curvature is observed in six different varieties:—(a) Primary right dorsal scoliosis; (b) primary left dorsal scoliosis; (c) primary left lumbar scoliosis; (d) primary right



FIG. 80.



FIG. 81.

lumbar scoliosis; (e) primary left convex total scoliosis; (f) primary right convex total scoliosis.

SYMPTOMS AND COURSE.—In cases other than congenital spinal curvature comes on gradually with stooping or other un-

natural attitudes of the body, with weakness of the muscles, slight pain or sensitiveness in the dorsal and lumbar regions, and weakness of the back. The child is unable to occupy one attitude long without complaining. As a rule it is cachectic, even anemic, its

limbs are illy developed, it is likely to be pigeon-breasted, with high collar bones, its head is unusually large, quite out of proportion to the size of its neck, and it will be remembered that as an infant it had troubles incident to dentition, as diarrhea, slow closure of the fontanelles, difficult teething and perhaps a more or less confirmed degree of marasmus.

Examination of the naked child in the standing posture, posteriorly, shows the lower angle of the right scapula to be unduly prominent and somewhat elevated in the first or primary right dorsal curvature, the opposite scapula being likewise more prominent and elevated in the second curvature, that of the left dorsal. With this peculiarity of the scapula it will be observed



FIG. 82.—Case of Mixed Curve. (Wilcox.)

that the corresponding iliac crest has altogether lost its normal prominence, while the opposite one is more than usually distinct. A line drawn from the seventh vertebral prominence of the cervical

region to the coccyx will show the spine to be deflected to the right in the dorsal region, and to the left in the lumbar region, when the curvature is of the first class, exactly the opposite curvature being observed when it comes in class "b." In such a child the abdomen is generally prominent, the chest

is flattened, the neck is pitched forward at an abnormally acute angle, and the thorax is distended on the side corresponding to the concavity of the



FIG. 83.—Examination of normal spine. (Hodge.)

curvature. The subject is ungainly in gait and in standing the knees are thrown forward, the arms hanging loosely and clumsily by the child's sides.

If care be exercised in making the examination it will be observed that the patient can stand in the erect or correct position for but a minute or two. He soon complains of pain and weakness of the back and inability to assume a perfectly erect position and retain it. The condition of the bony column is not alone responsible for this, the spinal muscles soon becoming weak and enfeebled on the relaxed side and altogether unable to perform their function.

TREATMENT.—The treatment of this type of curvature will depend in good part upon its cause. If due to a shortened limb, whereby with every step the spinal column is deflected from its normal position to one side or the other, compensation must be

made by a suitable shoe, the sole being sufficiently thick to enable the patient to stand straight upon his legs and feet so that the spine is not drawn to one side when at rest. If the muscles have already been weakened they should be subjected to a vigorous course of mas-

sage and electricity, care being exercised that the tender vertebrae be not handled too roughly. Suitable gymnastic exercises, as mild calisthenics



FIG. 54.—Examination for flexibility of spine. (Halla.)

and light suspension practices by means of rings suspended by cords from the ceiling, will serve to strengthen the muscles of the back, arms and chest, these serving as natural splints to correct the abnormal position as their vigor is improved. The patient must be put upon a wholesome, nourishing diet, constitutional remedies to overcome the rickety state, and the use of such apparatus as is demanded in individual cases for overcoming the bony deformity. For special Swedish movement practices and other gymnastics that may be employed in the general treatment of the various types of spinal curvature works on orthopedic surgery should be consulted.

For the right dorsal curve it is accounted useful to isolate the left arm by placing it in the neck-rest position, a position where the neck is most at rest, the right arm is to be extended upward with a moderate degree of resistance, secured by having the child hold a weight in its right hand while the arm is extended; the body should be thrown forward with firm support about the child's waist, these various attitudes and exercises being practiced from four to six or eight times in the course of a few minutes, the

child resting thereafter and then practicing them again. If followed systematically two or three times a day, the *séances* lasting fifteen to twenty minutes each, general improvement will be noticed within a few weeks.

For the left lumbar curve the rhomboid muscles are contracted by proper exercise and the lumbar muscles are vigorously massaged. If there is double curve of the left side the arms should be exercised separately, the left hand being placed upon the hip, the right side being exercised by flexion and extension of the fore-arm with the hand extended. The patient must also take downward straight-stride standing position four times in quick succession, so as not to allow the balance to be re-established, this being followed by chest movements incident to forced respiration. (Young.) Where possible the various exercises that are prescribed with reference to the cure of a lateral curvature should be taken under the direction of a competent orthopedist.

MECHANICAL APPLIANCES.—Throughout all time efforts to overcome scoliosis have been made by various mechanical contrivances, some of which are very ingenious and commendable, others equally clumsy and harmful. The plaster of Paris jacket, leather jackets, lead jackets, myotomy, tenotomy and other practices have been resorted to from time immemorial. Late authorities are not loud in their praises of these various contrivances, some condemning them altogether, others agreeing that in pronounced cases in which gymnastics and massage are not effective it is permissible to use supporting apparatus. Sayre's suspension apparatus has long been recommended and used with more or less success. Shaffer's brace is among the best, consisting of a steel waist-band with verging steel pieces in front and back attached together with webbing from the waist-band, a crutch being built up under the depressed shoulder and a pad over the deformity. Webbing straps are passed between the pad and crutch, in front and behind, acting laterally upon the prominence.



FIG. 55.—Shaffer Spinal Brace attached to one of left dorsal scoliosis.

It is not held that this apparatus overcomes the deformity; it is used as a support to the body during intervals of exercise and recumbency and as a reminder to the patient of the necessity of a correct attitude.

Antero-Posterior Curvature.—The second and third classes of spinal curvature, kyphosis and lordosis, are likely to be observed

in the same subject, consequently are considered together; in fact, scoliosis is rarely seen without some antero-posterior curvature in association with it. Lordosis, or anterior curvature, is to a certain extent compensatory, the idea being to prevent the center of gravity being pitched too far forward. It is a very common condition in corpulent adults and in pregnant women. It is not often seen in children except as an attendant upon other spinal deformities. Kyphosis is the result of flattening of the vertebral discs from pressure from any cause. Antero-posterior curvature that does not arise secondarily to other curvature of the spine or from coxalgia is likely to be due to paralysis of the erector spine muscles. In the pseudo-hypertrophic paralysis of children lordosis, or saddle back, is often observed.

SYMPTOMS AND COURSE.—In antero-posterior curvature the chest is flattened, or pigeon-breasted, the shoulders are seen to be widely separated and the angles of the scapulae are unusually prominent, projecting acutely; the abdomen is protuberant, the patient complains of backache and soon wearies at exercise. If the kyphosis is recent it disappears when the patient lies in a prone position.

Lordosis is easily discovered, the spine projecting forward into the abdominal cavity so pronouncedly that the subject is sway-

backed, the posterior concavity of the spinal column being noticeable in proportion to its degree. The subjects of this type of spinal deformity are always rickety children, those who lack proper nourishment and whose bony systems are slow in ossifying.

TREATMENT.—In a general way the successful treatment of antero-posterior curvature will depend upon gymnastic



FIG. 86.—Attachment of Taylor's Antero-Posterior Splint.

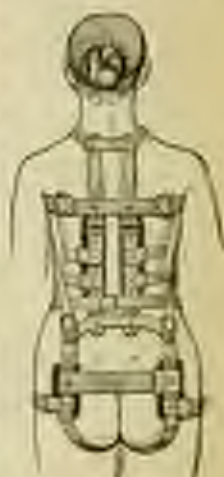


FIG. 87.—Taylor's Splint.

exercises applied with reference to the curve of the spine. Naturally it is not possible to so apply mechanical contrivances that lordosis can be overcome thereby, it being impossible to compress the spinal column from in front or to so grasp it from behind that it may be secured in proper axis. Various appliances have been made with the idea in view of properly supporting the spinal column whereby this deformity may be held in check or overcome in part, but as a

rule they have not been successful. The apparatus of Taylor's as an antero-posterior spinal support shown in Fig. 87 is among the best. It consists of a pelvic band upon which are attached two annuleted steel uprights admitting of easy bending and manipulation, connected with two transverse bars from which shoulder-pieces arise. When applied the upright pieces rest upon the transverse processes throughout the greater part of the spinal column, including the seat of deformity. Pad plates formed of softer steel are fastened to the upright by hinges and screws admitting of ready removal and bending, extending some distance above and below the site of the deformity. They are covered with hard rubber or ground cork enclosed in cotton flannel, the shoulder pieces are provided with covered webbing straps, and the transverse bars and pelvic band have buckles. The apparatus is securely held in position by an apron of stout muslin and webbing straps.

For the purposes of measuring a child for this apparatus it should be laid upon its abdomen and a piece of soft lead carefully moulded to the form of the transverse processes from the anal fissure to the upper border of the capula (Fig. 88); the pelvic band is



FIG. 88

measured from one trochanter to the other; the upper parts of the uprights are bent backward so as to rest upon the surfaces when applied in the recumbent position, making gentle traction backward. The brace is applied while the child is in a recumbent posture,

the pelvic band being secured first, the axillary straps next, to the lower transverse bar, and then the upper apron straps being attached to the buckles of the upper cross bar. The middle straps of the apron are secured over the upright by means of safety pins. It goes without saying that these apparatuses are much more valuable in Potts' disease or kyphosis, the angular curvature described under class four, than in simple antero-posterior curvature, combining scoliosis and lordosis. They are occasionally useful, however, in the latter type of spinal deformity.

Angular curvature due to caries of the spine, commonly known as Pott's disease, will be considered in a separate chapter.

CHAPTER CXVII.

POTT'S DISEASE—SPINAL CARIES.

General Considerations—Symptoms and Course—Treatment—Operative Measures—Medication—Diet and Hygiene.

General Considerations.—Caries of the spine, kyphosis, or angular curvature of the spine, commonly passing under the name of Pott's disease, because accurately described by Sir Percival Pott more than a century ago, occurs especially in strumous children, although it may occur at any age of life. In almost all cases tuberculosis or syphilis is at the base of the trouble. Exciting causes are blows, strains, or other injuries to the dorso-lumbar region, which is most likely to be the site of the carious process, and the exanthematous fevers are responsible in strumous children for a large per cent. of all cases seen. The cancellated tissue of the anterior portions of the bodies of the vertebrae that are the site of the disease undergo carious inflammation, the exudation flowing into the Haversian canals and spaces and the canaliculi,



FIG. 89.—POTT'S ABSCESS. (Boileau.)

the bone-corpuscles, the embryonic tissue and bone undergoing thinning and destruction because of absorption by pressure and softening. By this process of rarefaction the bony spaces are enlarged, septa are destroyed, and several spaces are thrown into one. As a rule the periosteum becomes inflamed and separated by the exudation, and the bone is covered with tiny pits,

its structure becoming so softened that it can be readily incised. Where suppuration follows the bone becomes carious and caseation of the inflammatory products is almost sure to follow. In strumous osteitis strumous caries is the common result. The body of the vertebrae and the adjacent vertebral discs become softened and more or less destroyed, the process extending to adjacent vertebrae. In rare cases the inflammation may begin in an intervertebral disc. It being the function of the spinal column to support the weight



FIG. 90.—LUMBAR ABSCESS. (Boileau.)

of the body it will be readily seen that when inflammatory softening of portions of that column occurs the softened bones are compressed, and that unless the carious process is evenly distributed, which is never the case, an angular deformity is produced, the anterior part of the vertebral bodies being so destroyed as to become shortened, while the posterior part, with their firmer spinous processes, are not affected and, therefore, project more acutely and prominently backward. Ankylosis, either fibrous or bony, occurs as a result of inflammation in a share of cases, the softening process being thus arrested and the disease and deformity being held in check. It rarely happens, however, that Nature is thus able to defend herself from increase of the carious inflammation that is going on, the disease spreads, and very often pus is formed, with resulting abscesses in the lumbar or dorsal regions (Fig. 80), or showing as psoas abscess (Fig. 89), and even as retro-pharyngeal abscess (Fig. 89) when the cervical spine is the site of the inflammatory process. Occasionally the spinal cord is so compressed that paralytic symptoms are set up. Paraplegia is sometimes present, but is usually temporary and soon overcome.

If the carious destruction is located in the cervical region there is danger of pachymeningitis, and death may occur from exhaustion, amyloid degeneration of the kidneys, constitutional sepsis, pressure upon the cord, with paralysis, and in rare cases subsequent pneumonia, peritonitis or pleuritis.



FIG. 91.—Upper Dorsal Pott's Disease. (Young.)

Pott's disease has been held to occur with greater frequency among boys than girls, but recently collated statistics go to show that it is observed with about equal frequency in both sexes. Carious inflammation of the spine occurs in about one-third more cases than does coxalgia, and it is five or six times as frequent as tuberculous inflammation of the knee joint. It is not observed in animals walking upon all fours, this going to show that the erect position of the human body is the factor in its production. It occurs as many times in the dorsal region as in all

other spinal regions combined, being next more common to the lumbar vertebrae. Billroth and Menzel state that in regard to individual vertebrae caries is found in the first and second cervical, in the sixth, fourth and eighth dorsal, in the fourth and fifth lumbar, the tenth and ninth dorsal, and the third cervical in the order given.

The disease is seen in earliest infancy, more than one-half of the cases, according to Taylor, being found in the first five years of life, and eighteen per cent. of the remaining cases being observed in the second half decade. It is most common among strumous children and next most frequently seen in subjects of syphilitic history.

It not infrequently happens that children who are sufferers from spinal caries have caries or necrosis of bone in other parts of the body, while in numerous instances it is an attendant upon well developed infantile phthisis. Early decay of the teeth and unhealthy conditions of the maxillæ are common in young subjects who are sufferers from spinal caries, and it has been observed that the disease is more likely to develop in the cervical region when the bony tissues of the mouth are carious.

Symptoms and Course.—Incipient Pott's disease is attended by pain in the back, increased by motion and pressure, and especially by sudden jars, as a misstep or jar imparted upon sitting down. The pain is not always limited to the immediate region affected, neuralgic pains shooting into distant parts. If the cervical vertebrae be the site of the inflammatory process wry neck, facial neuralgia, spasms of the muscles of the throat, and allied symptoms are observed. When the dorsal vertebrae are affected there are intercostal neuralgia, cramps in the chest, pleurodynia and pain upon deep breathing. If the lumbar or lower dorsal vertebrae be inflamed there may be severe sciatica, cramps in the muscles of the legs, early fatigue of the lower extremities, inability to stand for a considerable length of time, and other sensations of discomfort. In general the child becomes easily fatigued, is moody, peevish and unhappy. It carries itself rigidly, and in stooping does not bend its back, but bends its knees or gets down upon the knees, constantly keeping its spine as erect as possible.

Palpation usually reveals a painful spot at the site of the inflammation, and a sudden jar upon the spine or downward pressure upon the shoulders or head will cause the child to complain of pain at the same site. As a confirmed diagnostic sign it will be well to lift the child up by the shoulders, this act giving relief, pressure of the upper part of the body upon the affected vertebrae being thus removed. When the case has gone on to deformity, so that the spine projects angularly backward, all doubt as to the diagnosis is removed.

If the cervical vertebrae be the site of the carious process difficulty in breathing and torticollis are experienced, the comfort of the patient being greater as the head is supported by the hand. Rigidity of the muscles of the spine is an early and ever present symptom. This may be due to an unconscious effort on the part of the patient to avoid motion or jarring of the carious vertebrae, or it may be of the nature of a muscular reflex spasm similar to that found in caries of joints elsewhere.

Diagnostic attitudes are wry neck, when the upper cervical region is the site of the disease; when the cervical and dorsal vertebrae are affected the neck is pushed forward, the chin is elevated and the shoulders are drawn up; when the dorsal vertebrae are carious the column is curved forward above and below the site of the disease, the shoulders are elevated, the body is shorter than normal



FIG. 92.—Occasional attitude of rest in cervical Pott's disease. (Bradford and Lovett.)

and the spine is held as rigid as possible, a dress-parade attitude; if psoas abscess has formed or the psoas muscles are irritated, as in lumbar caries, the patient stands upon one leg, the other thigh being flexed, the body is bent forward and one hand rests upon the knee. Pain is not an invariable symptom of Pott's disease, though so commonly present as to be accounted diagnostic. It may be subacute or intense and lancinating. In other cases it is not over pronounced, amounting to



FIG. 93.—Attitude of rest in dorsal caries.

more of an irritation than severe pain. It is occasionally deep-seated, dull and intermittent. In other cases there are sharp, radiating pains in remote parts of the body, with only tenderness in the affected region discoverable upon palpation. The characteristic physical symptom of Pott's disease is the angularity of the projection, its median position and its rigidity. The rigidity is more likely to be due to spasm of the muscles than to ankylosis. It is not likely to be confused with other carious conditions, except that when the lower lumbar vertebrae are inflamed it may be mistaken for hip-joint disease. A little care in making the examination will easily clear up the diagnosis, the symptoms of the two diseases being very different in many respects.

Treatment.—Inflammatory softening of the vertebrae when acute is accompanied by pain, fever and general constitutional disturbance. The carious process pursues about the course of caries elsewhere, especially about the hip, and requires practically the same treatment—perfect rest and remedies that will allay the constitutional symptoms and hold in check the progress of the disease as far as possible. The child should be placed upon a firm mattress upon which the pressure of its body will be quite evenly distributed. Anti-inflammatory remedies as *Acetic*, *Veratrum*

viride, *Gelsemium*, *Belladonna*, *Arnica* and *Ferrum phosphoricum* will be found useful in the acute stage of inflammation and suffering. Later they will not be required, but will have to be supplanted by *Silica*, *Hepar*, *Arsenicum*, *Calcarea*, *Phosphorus* and similar remedies to control the suppuration and check the extension of the carious process.

After the disease has passed the inflammatory stage, or when it is not active, it will be found necessary to apply a supportive apparatus, as Sayre's plaster of Paris jacket or the Taylor apparatus for supporting the weight of the trunk so that it will not rest



FIG. 94.

dependent upon the spinal column, thus causing compression of softening vertebrae. The Sayre jacket is applied by suspending the patient as shown in Fig. 94, his trunk being covered with stockinette, or an ordinary sleeveless woolen shirt, the garment fitting closely. The breasts should be protected with



FIG. 95.—Suspensory apparatus for application of the plaster jacket.

cotton while the jacket is being applied, the epigastric region being covered with a folded towel in order to prevent a too close fit of the jacket over the stomach. The rollers of which the so-called jacket is made are composed of cheese-cloth or butter-cloth, which is thoroughly impregnated with fine dental plaster. The patient is suspended by the head and shoulders so that the toes barely touch the floor, the bandages are thoroughly wet by being placed, one at a time, on end in warm water until the air-bubbles cease to rise from the roller; they are then squeezed nearly dry and applied quickly, commencing at the lower part of the body, the roller being applied directly over the undershirt. A succession of these rollers should be quickly applied from below upward until the entire trunk is closely encased in a snugly fitting cast. Much practice is necessary to enable the physician to fit Sayre's jacket snugly and with the requisite nicety. All points that are likely to be brought in contact with the tissues must be smoothed and rounded off in order that there may be no points of irritation. It is also necessary that the edges of the bandages shall be smoothed with the

free hand as the bandage is being applied, the plaster being evenly distributed in all directions. When completed the patient should remain in a suspended position, if it is not too uncomfortable, until the jacket firmly dries. If the position is tiresome the child should be placed in the recumbent position until the plaster is set. It should then be cut down in front, the armholes trimmed, the edges being nicely bound, corset fashion, and lace holes be punched at convenient distances, far enough away from the free edges to hold securely, in order that the jacket may be subsequently laced most snugly as required.

The plaster of Paris jacket answers very nicely as an economical help in cases of Pott's diseases, not requiring support of the head. In all cases of spinal caries in which vertebrae above the seventh dorsal are affected a chin-rest will be required,



FIG. 95.—Sayre's jury-mast.

to relieve the superincumbent weight and to extend and fix in permanent position the diseased area. Sayre has contrived such a support, termed the jury-mast. It is adjusted to the leather jacket and has two up-rights fitted to the back of the head, these holding it firmly in position, so fixing it that harmful motion is not possible (Fig. 95). The same



FIG. 96.—Astero-posterior spine brace, with chin-rest.

results are obtained by the use of the chin-rest, devised by Young, for use in connection with the spinal brace as shown in Fig. 97. Wilcox, of New York, has also devised an ingenious head and chin splint (Fig. 99) for use in caries of the vertebrae, that is especially to be commended.

Perforated leather jackets and various forms of metal jackets have been used in place of the plaster of Paris cast. They have the advantage of being more cleanly and less cumbersome, though somewhat more expensive and not always available in general practice. The leather jacket is shown in Fig. 98. It is perforated, an advantage not possessed by the plaster cast, can be moulded to the form with equal nicety, and can be so snugly fitted and so perfectly made that it will not interfere with the use of the ordinary clothing. Felt jackets have also been advised and found to be very satisfactory after the subjective symptoms have subsided. In caries of the spine at or near the cervico-occipital articulation

it will be necessary to support the child's head by a pillow under the nape of the neck, with a sand-bag on each side of the head and neck, the patient being kept in the supine position. In young subjects, if the disease shows signs of progression, it may be necessary to continue the patient a long time in the jacket or other mechanical contrivance, even over a period of months at a time. So long as there are evidences of caries going on, as shown by the consti-



FIG. 27.—Wilcoor's joint-rod.

tutional symptoms, tenderness in the affected region, increase in the temperature, and other symptoms, it will be necessary to keep the spinal column fixed and extended. It is not possible to treat exhaustively of the management of the various forms of spinal curvature, especially of Pott's disease, in a general work on Diseases of Children. Special works on Orthopedic Surgery will have to be consulted. Only enough has been here given to outline the treatment in a general way.



FIG. 28.—Perforated leather jacket for Pott's disease.

OPERATIVE MEASURES.—Caries of the lumbar and last dorsal vertebra sometimes require operative treatment. Treves' method is to make an incision at the outer border of the erector spinae muscle radiating from the last rib to the iliac crest, incising directly downward to the lumbar fascia. The lumbar aponeurosis is opened, the erector spinae is retracted inward, and the anterior portion of its sheath is incised.

The quadratus lumborum is next incised, and following upon this the anterior leaflet of the lumbar aponeurosis is slit. All loose pieces of bone are removed with forceps, and all cavities are thoroughly curetted with Volkmann's sharp spoon or other bone curette. The wound is irrigated with a selected antiseptic solution and is usually dusted thoroughly with iodoform. A large drainage tube is inserted, the wound is packed with gauze, cleansed by suture of silk-worm gut and is dressed antiseptically.

If it be clearly demonstrated that suppuration is taking place at any other site curettage and drainage may be demanded, all operative procedures upon the spinal column being performed under strict antiseptic practices and with extreme care, the danger of setting up myelitis from traumatism or infection being borne in mind.

MEDICATION.—Besides the exhibition of anti-inflammatory remedies when Pott's disease shows in a child as an acute ailment, there are constitutional remedies that are of value in the treatment of the chronic form of spinal caries which should not be overlooked. Chief among these is *Calcaria phosphorica*, and next in order are *Silicia* and *Calcaria fluorica*.

Calcaria phosphorica is especially adapted to the suppurative process in the bony tissues of children. Besides the typical *Calcaria* constitution, which must be present if the best results are to be obtained, this remedy has the softening condition of bones that belongs to *Phosphorus*. Caries of the hip-joint, and other types of bony softening due to rickets, mal-nutrition and to the strumous diathesis will be best met by *Calcaria phosphorica* in a large per cent. of cases. There are cramp-like pains in the neck and between the scapulae, backache and pains in the lumbar region, with lumbar abscesses. The child is rachitic, emaciated and shrunken, with a tendency to boils and ulcers. Carious abscesses, the result of inflammation of the vertebrae, respond more readily to *Calcaria phosphorica* than to any of its analogues.

Calcaria carbonica is also of value in the rachitic child with curvature of the spine and caries of the bones, either of the spine or extremities or both; children who have had difficulty in dentition, whose teeth decay early, who are phlegmatic and flabby, in whom spinal caries sets up respond to *Calcaria carbonica*.

Aurum will be found valuable in spinal affections due to syphilis. The bones of the spine are painful to touch, especially painful at night.

Kali hydriodicum is also beneficial in spinal caries due to syphilis. The periosteum and ligaments are softened.

Silicia covers inflammation, softening and necrosis of bone wherever found. Abscess of bone resulting in fistulous openings from which a discharge of offensive pus occurs calls for *Silicia*. In tuberculosis of bone with curvature of the spine and general debility of the patient *Silicia* should be given over a long period of time.

Phosphorus is complementary to *Silicia* in bone diseases. It is more especially useful for caries of the lower jaw, exostosis of the skull, and hip-joint disease, but will also be found valuable in spinal caries in suited cases. The child is weak, cachectic and suffers from dyspnea, headache and general languor. *Phosphorus* is particularly homoeopathic to spinal caries occurring in subjects of incipient tuberculosis at or about the age of puberty.

Baryta carbonica may also be required in scrofulous children with caries of the spine, whose glands are enlarged and indurated. There are tearing pains in the bones, worse at night, and also boring, deep, aching pains in the bony structure.

Argentum, Iodum, Fluoric acid, Phosphoric Acid, Kali bicarbonicum, Metocrenon, Symphytum and *Lithium carbonicum* may be required in special cases. The use of the properly selected remedy over a considerable length of time in rachitic children who are the subjects of spinal caries will be attended by gratifying results, especially if the proper mechanical appliances be called into requisition to relieve the pressure and overcome the mechanical irritation arising therefrom. The best results are usually secured by the administration of the medium or higher potencies of the selected agent, it not being too often repeated.

DIET AND HYGIENE.—In no class of chronic diseases of children is it more necessary that the patient should have the benefit of fresh air, outdoor exercise, wholesome diet and, perhaps, change of climate, than in Pott's disease or other form of spinal curvature. These ailments are generally dependent upon rickets or scrophulis, and subjects of spinal curvature are usually anemic, non-resistant, cachectic. Although by no means limited to humbler homes spinal caries is much more commonly seen in hovels and among children who are poorly nourished and whose hygienic surroundings are bad. It is not reasonable to hope for the best results if the food upon which the child is sustained be deficient in bone-making elements. It should be varied and wholesome. Fresh meats and fresh vegetables, milk in young subjects, wheaten flour, or perhaps gluten bread, and an otherwise sustaining and upbuilding diet is absolutely demanded. In very many cases cod-liver oil will be required, especially in children of tuberculous tendencies. This may be given in the form of Squibb's tasteless and odorless oil or Phillips' digestible emulsion. Another excellent preparation, especially applicable in children of weak muscular structure, and who are emaciated and marasmatic, is Angiers' petroleum emulsion. Protenoll, Mardock's liquid food, bovine and similar preparations, are especially beneficial in youths, while in younger children it is not always best to rely too much upon meat food. In these subjects Mellin's food is one of the best types of Liebig foods, being found very satisfactory.

Salt bathing and salt air are very invigorating and helpful to the subjects of spine caries. Children who live in the interior should, if possible, be removed to the seashore. Where this is not convenient home sea-bathing may be practiced, by means of evaporated sea-salt dissolved in the daily bath. The old method of confining children with carious spines to the house, perhaps to the bed, is highly objectionable. In every case, excepting in acute cases, where rest is absolutely necessary, the child should be fitted with proper supporting and fixing apparatus so that it is possible for it to have outdoor exercise, even to engage as best it can under the restrictions of its orthopedic harness in the games of its play-fellows in the fresh air. Where it is not convenient or

possible to remove the little subjects to the seashore or mountains it is very advantageous for them to have the benefit of country life for a few weeks or months on some neighboring farm. The advantages of suited mechanical contrivance for the relief of pressure and fixation of the spinal column, the suited constitutional homeopathic remedy, and proper nourishment, exercise and hygiene are of incalculable value in chronic spinal caries, resulting, when intelligently applied, in a very satisfactory cure in a good per cent. of cases.

CHAPTER CXVIII.

HIP-JOINT DISEASE.

General Considerations—Etiology—Diagnosis—Pathology—Symptoms and Cause—Complications—Prognosis.

General Considerations.—Coxalgia, or hip-joint disease, is the next most common form of caries of bone to Pott's disease that is observed in child-life. About two-thirds as many cases of caries of the hip-joint occur in general practice as caries of the spine. It is observed in nearly five times the number of cases that show inflammation or caries of the knee, and very much more often than all other tuberculous inflammations of bone in children combined, with the single exception of spinal caries.

Hip-joint disease is essentially a tuberculous affection of the coxo-femoral joint. It is almost altogether an affection of child-life, being rarely observed after twenty years of age; more than one-third of the cases occur in children under five years old and by far the larger proportion of all cases observed occur prior to the fifteenth year. The left side seems to be more prone to the lesion than the right, the proportion being in the ratio of three to two. It is more commonly seen in boys than in girls, and is found with greater frequency in the homes of the poor than among the well-to-do classes. It is almost always confined to one side, though double hip-joint disease is occasionally observed. Ridlon of Chicago reports fourteen such cases.

Etiology.—Hip-joint disease as commonly seen in general practice is a tubercular inflammation of the joint, yet tuberculosis is not the invariable cause. In many young children the primary etiological factor is trauma, the inflammatory process arising from injury to the hip-joint, communicated by means of falls or blows received in efforts at learning to walk and at play. In a large share of cases the inflammatory process takes on the character of traumatic synovitis, while in typical tubercular coxalgia the

nature of the lesion is of the character of tubercular arthritis. The questions of age, sex, heredity, constitutional dyscrasia, nourishment and general hygienic surroundings enter into the etiology of hip-disease as predisposing factors, while the more common exciting causes are traumatism and septic fevers in early child-life, the exanthematous fevers being the active cause in the greater per cent. of cases, scarlet fever, especially, being followed in strumous subjects by caries of the hip, typhoid fever coming next in causative influence.

Strumous children are subjects in whom hip-disease is most often observed; children whose parents are tuberculous are its common prey; syphilis is a far less frequent operating cause, but is occasionally responsible for the disease. Even where it is not possible to trace a tuberculous genealogy the tubercular tendency is still responsible in a majority of instances. Gibney in a careful analysis of two hundred and sixty-five cases found that phthisis occurred in the father's family fifty-three times, in the mother's family fifty-six times, while on the paternal side struma was an operating feature in ten cases and upon the mother's side in eighteen cases; so that of two hundred and sixty-five cases observed one hundred and thirty-seven were traceable to a strumous or tuberculous cause. In a number of cases syphilis was accounted responsible; a bad rheumatic history also presented in a small proportion, and in a few cases it was thought that parental alcoholic debauchery lay at the bottom of the trouble.

Diagnosis.—The general diagnostic symptoms of hip-joint disease in young subjects are, in order of frequency and importance, a degree of immobility of the joint, wasting, lameness, the characteristic attitude, pain and swelling.

In some cases pain in the hip is the first symptom complained of, but as a rule it will be observed that limitation of motion is the initial sign, the muscles of the hip and thigh being kept in a state of tetanoid rigidity, in the effort of the patient to secure immobility of the joint in order that the feeling of discomfort and pain which is doubtless experienced even at this early stage may be overcome as much as possible. This rigidity is especially noticeable in making examination of the affected limb, the child holding the muscles of the leg firmly in order to protect the joint. There is also an unconscious tetanoid spasm, partaking of the character of forced flexion, forced extension and forced rotation. In undertaking to describe an arc with a limb in making examination this rigidity may not be noticeable until the extremity of the arc is reached, and in special cases it may be necessary to anesthetize the patient before the condition of the joint can be ascertained by the surgeon, because of this state of tetanoid spasm, in many cases uncontrollable upon the part of the sufferer.

Atrophy, or wasting, is the next noticeable symptom of hip-disease. It is the result of the reflex muscular spasm, and by comparing the sound side with the diseased hip is early noticeable. The adductors are first atrophied and subsequently the fold of the nates disappears through wasting of the buttock muscles. As the limb is affected by non-use in the child's efforts to secure mobility of the joint, as shown by its being carried in the state of rigidity and being moved in the state of fixation, in harmony with the movements of the side of the body that is affected, the thigh muscles and muscles of the calf become soft, flabby and atrophied. In non-sensitive subjects it is frequently the case that wasting of the affected hip is a more noticeable symptom than rigidity of the muscles.

In those cases in which close observation of their children is not exercised by parents the earliest observable symptom may be lameness. This is usually due to the rigidity of the muscles described, while in other cases it amounts to a limp in the

effort of the child to relieve the pressure of the head of the femur against the affected acetabulum. As the limb becomes more fixed and shortening occurs as the disease progresses the typical hip-joint gait becomes characteristic and pronounced. The hip-joint attitude is well shown in Fig. 100. Adduction and abduction occur, depending upon whether the pelvis is tilted upward on the affected side, resulting in shortening of the limb, or whether it is tilted downward, giving rise to elongation of the affected leg. When the pelvis is tilted, either upward or downward, it will be observed by drawing a line between the anterior superior spinous processes which should intersect at right angles a line drawn from the umbilicus to the pubis. The deflection depends upon the fact that in walking or standing the limbs must be made parallel, and if one is longer or shorter than the other it throws the pelvis out of plumb. Shortening results from destruction of bone, either from disease or retardation of growth. It may also be due to spontaneous dislocation, this



FIG. 100. — Hip-joint disease, characteristic attitude.

being, in turn, due to caries. Where the pelvis is tilted downward the affected leg may appear to be an inch or more longer than the well leg. If the tilting be upward it may be correspondingly shorter. The joints appear to be thrown outward, causing considerable deformity of the hip on the affected side. To the careless observer the elongation due to the downward tilting of the pelvis may lead to the suggestion that the opposite, or well side,

is the affected one, the normal condition in confirmed hip-disease being a shortened state of the leg from dislocation upward of the femur upon the ilium.

Pain is not always present. In some subjects of hip-joint disease it is not complained of at any time during the course of the ailment, while in others it is pronounced in all stages. It is not always, in fact not commonly, complained of in the hip, the characteristic hip-joint pain being ascribed to the knee. This has long been supposed to be due to nerve reflex, but it is now believed that it is commonly the result of myelitis. It is intermittent in character and more pronounced in the femoral type of coxalgia, this again going to show that it is due to the inflammatory process that is going on. When the entire joint is affected, as in arthritis, the pain is constant and there is a feeling of tension and tenderness over a considerable area in the immediate joint region. A characteristic symptom in the acetabular form is increase of pain upon jarring the hip or in resting the weight of the body upon the affected limb. A supposed pathognomonic sign has been the pain that is elicited by striking sharply upon the knee or hip with the leg in the position of extension. In the acetabular variety this sign is of some value, but upon the whole it is not to be relied upon.

Swelling occurring in the course of coxalgia is another symptom of value. It is more pronounced in the rheumatic type, is generally confined to the front and back of the joint, and is indicative of effusion or suppuration. In acute synovitis of the hip it may be very noticeable both anteriorly and posteriorly. In suppuration the swelling is confined to the region of the trochanters.

Hip-joint caries may be confused with Pott's disease, spinal paralysis, hip-joint synovitis, congenital dislocation and various hysterical affections. It is not necessary to enter into discussion of the differential diagnosis in this volume. It is believed that the diagnostic signs that have been given are sufficiently clear and distinct to enable the practitioner to recognize cases of coxalgia that come under his observation. It may be well, however, for him to carefully study in this connection the diagnosis of Pott's disease as given in the preceding chapter in order that he may distinguish between the two, the most common error made in diagnosis being the confusion of hip-joint disease and the lumbar variety of spinal caries.

Pathology.—Hip-joint disease partakes of the nature in the large majority of cases of destructive tubercular osteitis. Caries with eventual absorption of a portion or the entire constituents of the joint is a common result. The process is not unlike tubercular osteitis elsewhere. The disease begins in the bone in more than three-fourths of the cases, commencing in the synovial membrane in not more than five per cent. When observed as the result of

pus abscess it is synovial in nature, from direct extension of the inflammatory process to the synovial structure. Severe irritation of the synovia may set up this type of coxalgia, while in older subjects, as youths or adults, rheumatism is often an operating cause. Synovitis of the hip-joint may lead to tuberculous variety of arthritic inflammation. All degrees of destructiveness are observed in hip-joint disease. The epiphysis may be completely absorbed or it may be separated from the head of the femur and be found lying loose as a sequestrum within the joint.

In the severer forms the head and neck of the femur become carious and honey-combed. (Fig. 101.) In young subjects they may be entirely destroyed. The acetabulum is excavated and may be perforated by carious ulceration, with escape of pus in the pelvic cavity. In severe cases the cavity is occasionally completely absorbed and in her efforts to accommodate herself to the situation Nature may form a new and crude acetabulum by throwing out new bony formation. In some cases only the rim of the acetabulum is destroyed. In caries sicca there may be caseation without the formation of pus, the granulations that are formed even becoming cartilaginous, atrophied and cicatrized without suppuration ensuing. In a large proportion of cases the rule is, however, for pus to form, resulting in hip-joint abscess. If suppuration be extensive it is evident, according to Billroth, that the synovial membrane has not been destroyed, or that a large abscess is formed near the joint.



FIG. 101. — Tuberculosis of head of Femur. (Krause.)

Hip-joint disease is seen very often in association with caries elsewhere, most commonly in connection with vertebral caries, or it may be that the knee, elbow, shoulder, tarsus, carpus or an individual long bone is the site of osteitis. Phthisis pulmonalis is occasionally developed during the course of coxalgia, and it is not infrequently the case that glandular inflammation and suppuration are observed in strumous children who are subjects of hip-joint disease.

Symptoms and Course.—The more prominent symptoms of hip-joint disease have been referred to in the discussion of its diagnosis. The rigidity, lameness, atrophy, pain, peculiar attitude and swelling, all enter into the pathognomonic symptomatology of coxalgia. In the first stage the lump is among the early symptoms, being more noticeable when the child rises in the morning and generally passing away in a few hours. It is aggravated by excessive exercise, is not a constant symptom, may be present in any stage or absent in all, and is due to a combination of fixidity of the

muscles of the leg and tenderness of the joint. Pain is present in a fair share of cases; it is spasmodic and irregular, usually referred to the knee, being considered as a reflex symptom due to pressure on the obturator nerve, the irritation being transmitted to the short saphenous. A late explanation and one that is likely to be accepted as correct in a good share of cases is that in infective coxalgia there is a direct or sympathetic myelitis that renders the bone sensitive at its distal extremity. The pain of hip-joint disease is not often located in or about the hip in the early stage, therefore it is important that the significance of pain in the knee be understood.

Limitation of motion has been referred to, as also atrophy and the characteristic attitude, all of which are symptoms of importance. Besides these, in strumous children there is usually more or less enlargement of the inguinal glands, perhaps not discoverable except upon pressure over or above Poupert's ligament. In some children this is a pronounced symptom and considered to be almost pathognomonic. If the carious process comes on acutely there is quite apt to be fever, anorexia, headache, irritability or languor, and other constitutional symptoms. In some cases as a child falls asleep it becomes relaxed, perspiring freely about the head and neck, and also over the chest. The characteristic strumous cachexia is also likely to be present and pronounced.

As the process goes on into the second stage the lameness increases and tilting of the pelvis becomes observable. Pain in the knee increases, the child suffering in both knee and hip upon efforts at walking. Sudden jars, as a misstep, are likely to cause severe pain. At this stage careful examination of the affected joint will reveal a grating or crepitant sound as the limb is made to describe an arc, the child lying in the supine position, its muscles being completely relaxed with or without anesthesia. The nature of the pain is of some value in determining whether the carious process involves the entire joint or the acetabulum or femoral portion. The more pronounced the pain that is referable to the knee the more likely is the case to be one of femoral caries. If pain is described to be in the pelvis, in the neighborhood of the iliac fossa, the process is particularly likely to be acetabular; whereas, if pain is described to be directly in the joint it is looked upon as articular coxalgia. If the tissues about the joint become thickened and hardened it is considered good evidence that suppuration is going on within. In order to recognize this condition it is necessary that the trochanters shall be grasped with each hand, the thumbs in front, the fingers being applied well down into the anterior fossa, the two sides being carefully compared at the same time. In young subjects and those who are not over muscular it is not difficult to determine a positive degree of thickening and induration about the trochanter. In addition to these symptoms atrophy goes on until the buttock is absolutely flattened on the

affected side. The fold of the nates is completely obliterated and the muscles are wasted, though hard and tense. The characteristic hip-joint attitude becomes more noticeable, the foot being drawn outward and the leg somewhat extended and apparently elongated.

Among the more noticeable symptoms in the second stage of hip-joint disease is the nightly suffering of the patient, this being due to the relaxation of the muscular system that occurs during sleeping hours, at which time the affected portions of the joint are allowed to lie in close contact with each other, this causing such severe pain that it arouses the child from sleep with nightly shriekings; or it may but induce moaning and crying during the sleep of exhaustion. Careless observers are apt to mistake this nightly pain of coxalgia for the nightly terrors of wormy children and indigestion. Upon being aroused the sufferer will be able to locate the pain either in the hip or knee, and since there is nearly always at this time evidence of hectic, atrophy of the hip, lameness of the affected side, and other positive symptoms of hip-disease the confusion ought not to be allowed to obtain.

The third stage is characterized by pronounced abduction and shortening of the leg with dislocation and, in a large proportion of neglected cases, ankylosis of the hip-joint. There are always symptoms of suppuration, destruction of the joint, general constitutional disturbance, and, in cases indicating unfavorably, metastatic abscess form in remote organs, death occurring from exhaustion, septicemia, metastatic pneumonia or other fatal complication. When dislocation occurs the pain is usually relieved, the destruction of the head of the femur or of the rim of the acetabulum, or both, having been sufficient to allow the head to glide out of its socket, the pressure of the inflamed parts upon each other being thus removed. As dislocation occurs there may be a peculiar, acute, severe, even sickish, pain ascribable to the joint or its immediate locality, with subsequent deep aching and discomfort over the iliac fossa, due to the presence of the head of the femur in its unnatural position. The mobility of the limb is gradually decreased, adduction is increased, and the characteristic flexion and shortening of the affected leg observed in advanced hip disease is now seen. This may amount to a shortening of three or four inches, and as the leg becomes atrophied a comparison with its fellow shows striking differences in size and length. With complete abduction and shortening there will be observed an undue prominence of the buttock on the affected side, with pronounced obliquity of the pelvis upward and backward, and also compensatory curvature of the spine, the lumbar region being thrown forward and the dorsal region backward with double lateral curvature, this cock-screw shape of the spine being necessary to compensate for the absence of evenness of length of the legs and even distribution of support therefrom. One leg is made to bear the

weight of the entire body, this throwing the spine clear out of plumb. . . .

Complications.—Nearly all cases of hip-joint disease go on to suppuration. In *caries sicca* the pathognomonic state is that of non-suppurating osteitis. It may be either extra-articular or intra-articular and pursue a perfect course, even to necrosis, without the presence of pus. In other cases there may be caseation and absorption of pus without extensive destruction of tissue, the so-called residual abscess characterizing the lesion. In by far the larger proportion of cases, however, tuberculous abscesses occur. If the epiphysis is the focal point of the tuberculous process the abscess forms within the joint, but the pus may burrough and form an extra-articular abscess. Just the opposite condition may also occur, an extra-articular abscess finding its way to the cavity and involving the entire joint in the suppurative process.

There is nothing characteristic about the formation of pus in the hip joint, the symptoms being the same as those depending upon pus-formation elsewhere. The local symptoms are often confused, in the fact that pus may burrough beneath the rectus femoris and point on the anterior surface of the thigh, or it may travel down the thigh and point at the edge of the vagina femoris, or may gravitate backwards and open at the upper or posterior border of the great trochanter, or show in other remote locality.

In the femoral variety the abscess usually opens directly into the joint. In the acetabular form the pus may burst through the capsule and point in the inguinal region, or may perforate the pelvis and find an outlet through the rectum, bladder, perineum or elsewhere.

The hip-joint abscess is of the cold variety and presents the constitutional symptoms that are common to this type. It is rarely intensely acute, may be weeks or months in forming, and residual abscesses may exist within the joint for a number of years, rarefaction having early resulted.

Prognosis.—In pronounced tuberculous subjects, or in those whose systems are saturated with syphilis, or who are intensely rheumatic, hip-joint disease may pursue a severe course, resulting in destruction of life in from thirty to fifty per cent. of cases without treatment. The mortality without treatment is high, whereas with proper treatment it is very much reduced, even to twelve per cent. of cases in the non-suppurative variety. It has a common tendency to relapse, and even in cured cases is almost certain to result in deformity. If seen very early and subjected to the proper local and constitutional measures recovery is possible without serious defect; but very pronounced cases will certainly be attended by deformity and impaired usefulness of the affected joint. A great difficulty the physician and surgeon has to contend with in the treatment of this ailment is the length of time

required to obtain satisfactory results. From two to five years is necessary to effect a cure in fully fifty per cent of cases, while in some it is necessary that they should be under observation for from five to eight years. Naturally it is exceedingly difficult to keep an individual under observation for so great a length of time.

CHAPTER CXIX.

HIP-JOINT ABSCESS—HIP-JOINT DEFORMITY.

Hip-Joint Abscess—Treatment—Hip-Joint Deformity.

Hip-Joint Abscess.—In hip disease abscess of the joint is a common complication. In many cases following epiphysitis the tissues cicatrize without the formation of pus. In others the irritation and softening results in the formation of tuberculous abscesses. When these complications occur the treatment will depend upon the nature of the abscess. Rarefaction of the secretion with absorption may follow in caseous abscesses of the cold variety; or if proper support is given to the joint by bandaging the limb and practicing extension the pus that forms will almost certainly point outward, especially if perineal pads are worn while traction is employed, the pus being thus prevented by pressure from burroughing under the fasciæ. In other cases localized abscesses form, their contents finding their way outward through the tissues, leaving sinuses which are slow to heal, but which eventually close in a fair proportion of cases. The rule is, however, that the abscess fails to completely empty itself and a permanent sinus that discharges more or less constantly is left. In strumous subjects the quantity of pus that may be formed in hip-joint abscess and discharged through such sinuses is almost beyond comprehension, exhausting the vitality of the little patient, eventually leading to general constitutional break down.

TREATMENT.—In residual abscess of the hip, as this type of abscess may properly be called, the surgeon should open the joint, under anesthesia, curette away all caseous deposit and the pyogenic membrane that continues to secrete pus, the operation being under strict antiseptic precautions, the wound being subsequently drained and dressed upon general surgical principles. Abscess cavities that are properly cleansed are usually prompt in healing and the general constitutional state of the patient will be gradually improved.

Reasonable conservatism in regard to hip-joint abscess should govern in all cases in which abscess-formation does not threaten the life or vitality of the patient. If it develops gradually, is not attended by continued or intermittent high temperature, does not

discharge externally and act as a drain upon the vital forces, it may be left undisgorged. Absorption under proper constitutional treatment occurs in so many cases that it is only when the symptoms indicate an active inflammatory condition about the joint with acute abscess-formation that immediate interference is demanded. In all cases in which there is severe pain, high temperature, colliquative sweats and other profound evidences of constitutional affection free incision, under strict antiseptics and anesthesia, with immediate and thorough cleansing of the abscess-cavity, is absolutely demanded.

Pelvic abscesses are observed in association with hip-joint disease where absorption of the acetabulum has occurred during the course of acute abscess, or as a result of acute carious inflammation, with subsequent formation of pus in the joint. They also follow upon rupture of the capsule in coxalgic abscesses when the pus burrows over the pubic bone and in the iliac fossa. They are also seen to occur when the abscess extends upwards from beneath and between the abductors, spreading along the iliopsoas muscle into the pelvis, and occurring outside of the joint-cavity as the result of inflammation of the joint. If the pelvic abscess can be located it should be evacuated by aspiration by means of a large needle, and if it be easily approachable it may be well to follow aspiration with injection of its cavity with an ethereal preparation of iodoform, or with iodoform and glycerine. If ether is used it will be necessary to provide a vent for the volatilized ether, as the heat of the body is sufficient to cause the conversion of ether into vapor, which, if confined in a closed cavity, may cause sufficient distension to be painful, even dangerous. (Bradford.)

There is no reason why pelvic abscess resulting upon hip-joint disease should be treated upon any other than the most intelligent surgical principles. Aspiration may suffice, but if a considerable-sized abscess is formed it is better to resort to more radical measures for the purpose of securing thorough emptying, cleansing and drainage of this cavity. Fortunately, under present orthopedic methods the application of suited fixation and extension apparatus early in the history of cases seen in general practice, together with the exhibition of the proper constitutional remedies and supportive diet, renders the danger of abscess-formation much less than formerly. In strumous subjects, in children in squalid quarters who are poorly nourished and whose hygienic surroundings are bad, the complication of hip-abscess or pelvic abscess is an altogether too common one; and even in the delicate child of tuberculous parents in the higher walks of life it is all too commonly observed in spite of well directed efforts at its prevention.

Hip-Joint Deformity.—Various deformities result upon untreated or badly treated cases of hip-joint disease. In some cases extreme flexion of the limb, with marked tilting of the pelvis on

the affected side, downward and backward, the hip-joint being completely ankylosed, will be observed. In others abduction and in still others adduction, even to annoying degree, are the resulting deformities. In many cases coming under the observation of the general practitioner, and especially under the observation of the orthopedic surgeon, pronounced deformity is present before the case is seen for treatment. If flexion is present the child should be put upon an extension apparatus, preferably the weight and pulley traction, the patient being fixed in bed, the flexed limb being elevated to the angle of deformity, so that the patient is lying on his back, the weight and pulley attachment being applied in the axis of the now extended leg by means of a cord attached to the ceiling or bed frame, which supports the pulley over which glides the rope to which the weight is attached. The leg should be supported in this position by an inclined plane contrivance consisting of a board wide enough to support the leg, extending from the buttock to the ankle, upon which the leg in extension apparatus rests firmly. From day to day the degree of incline may be lessened and the cord supporting the pulley be lengthened in correspond, so that as flexion is overcome and the angle of deformity becomes less the leg can be lowered. Where it is not thought desirable to confine the patient to the bed during this process the Thomas splint or other suited contrivance can be brought into requisition to secure gradual extension of the leg, thus overcoming the deformity. In pronounced cases with severe and more permanent flexions it is necessary that the recumbent posture shall be assumed, efforts at overcoming the deformity being exceedingly gradual, the treatment necessarily being protracted.

In extreme cases the degree of incline of the leg will have to be changed very gradually, and it will be found necessary to increase the weight which is applied by means of pulley and cord from day to day until complete extension is brought about, the patient being meanwhile firmly secured to the fixation frame or bed by proper perineal bands, axillary bands and firm support over the abdomen and trunk. In milder cases, especially in the early stage of hip-disease, immediate correction of the deformity may be accomplished by anesthetizing the patient, placing the limb in the normal position and firmly securing it by means of plaster of Paris or other permanent fixation splint. In abduction, as also in adduction, the deformity is overcome more readily than in complete flexion by means of the weight and pulley method, or the application of the long traction splint applied in the line of the deformity but changed from day to day by means of set-screw contrivance until the normal position is secured.

OSTEOCLASIS.—Ankylosis is overcome by orthopedists by osteotomy where the union is fibrous, and by osteoclasis in bony union by means of a contrivance invented by Taylor in which firm pads are

applied over the well pelvis and over the diseased hip, these being connected by a firm steel yoke, the whole being provided by strong set-screws which, under anesthesia, are screwed into position by the application of strong force, thus breaking down the bony union. This latter method is not received with favor by the profession because of its lack of precision and the possibility of abscess-formation and other complications.

OSTEOTOMY.—Osteotomy contemplates the division of the bone above the great trochanter or between the trochanter major and the trochanter minor. Some operators prefer to divide the femur below the trochanter. The Gant operation, generally considered the best, contemplates a straight linear osteotomy; the patient lies upon the side with the sand pillow between the legs, prepared as for any antiseptic operation; the incision is made in the line of the femur, a chisel is inserted in the long axis of the limb and is turned when it reaches the bone until at right angles therewith; it is then made to cut through the bone by sharp blows with the mallet, the cutting edge being turned alternately forward and backward so as to cut obliquely through the shaft. The bone should not be completely divided, a shell of the femur on its inner aspect being left, this being subjected to fracture. As soon as separation of the femur is accomplished the flexed leg can be extended in most cases, and if the deformity be that of abduction the leg can be made straight with but little manipulation. Throughout the operation strict antiseptic methods should be employed, and when it is completed the patient must be put to bed on an extension frame and light extension practiced over a period of from four to six weeks.

Permanent shortening of the affected leg is the common occurrence in hip-joint disease, even under the best methods of treatment. It is due not so much to the loss of bone substance in the joint as to a general arrest of growth of the bones of the affected leg. The tibia, fibula and bones of the foot as well as the femur are atrophied, the nutrition of the diseased hip and leg being so interfered with that in many cases it is very much smaller and shorter than its fellow. Naturally there is no treatment that can be applied that will overcome the deformity. When the surgeon has practiced fixation and extension, thus overcoming or partially destroying the disease of the joint, when he has administered proper constitutional remedies, directed toward the dyscrasia that is primarily the cause of the patient's illness, when he has prescribed nourishing and supportive diet, whereby the patient's general health and strength is improved, and when he has given him the benefit of fresh air, massage, electricity and exercise, change to the seashore, mountains or country, and has otherwise improved the general condition and personal hygiene of the patient, he will have accomplished all that is possible for him to accomplish.

CHAPTER CXX.

TREATMENT OF HIP-JOINT DISEASE.

General Considerations—Mechanical Treatment—Operative Treatment—Medication.

General Considerations.—The treatment of hip-joint disease comprises the exhibition of constitutional homeopathic remedies that have specific effect upon the bony tissues and also upon the general constitution of the subject, resort to improved sanitation and hygiene, the employment of wholesome, nutritious diet and

daily exercise in the fresh air, together with such local mechanical apparatus as will secure fixed extension and proper immobility of the limb. In the early stage it is absolutely necessary that extension shall be employed with the patient in the recumbent posture,



FIG. 102.—Adhesive strips applied for extension. (Young.)

while later it is only necessary that continued extension by means of fixation apparatus shall be secured until all pathological processes that are going on within the joint have been overcome.

Mechanical Treatment.—Extension and fixation are the first measures to be practiced. These may be accomplished in various

ways. One of the most convenient in general practice is to secure counter-extension by means of weights attached to the foot and leg the foot of the bed being elevated. Two long strips of adhesive plaster, four or five inches wide at the upper end and about one-third as wide at the lower, are applied



FIG. 100.—Extension by weight and pulley. (Bohl.)

directly to the sides of the affected leg. The lower ends are folded back so as to form loops. Over these straps numerous strips of

adhesive plaster are applied in different directions, forming a complete lace-work over the shin and lower third of the thigh, thus securing the long wide side strips securely. Over this is applied a spiral roller bandage, extending from the ankle to the perineum. Buckles are secured in the loops at the lower end of the side strips for the purpose of attaching the weight subsequently.

A stretcher splint is often necessary for the support of the child's body. Of these there are various forms, known as the stretcher splint, the extension tray, the portable bed, and others. The Buck extension splint employed in the treatment of fractures of the femur and described in standard works on surgery is among the best.

The patient being properly secured in bed a rope is attached to the buckles playing over a pulley at the foot of the bed. To the distal end of the cord is suspended a weight sufficiently heavy

to overcome the normal contractility of the muscles, in this way securing proper extension of the limb and freeing the joint from the pressure that comes from muscular contraction. It is not necessary to

describe in detail the various methods that are employed for this purpose. The ingenuity of the surgeon will assist him in providing suitable apparatus in every case, while in hospital practice various appliances are always at hand. The temporizing portable bed, as constructed by Phelps, of New York, may be made by any ingenious physician. A board three quarters of an inch thick is cut to correspond to the shape of the child as it lies upon it, the board being four inches longer and three-fourths of an

inch wider than the patient. The child is laid upon the board and incased in a plaster of Paris bandage from the feet to the arm pits, of the thickness of three-fourths of an inch, the bandage being tacked to the edges of the board as it is passed around, it thus making a firm and substantial bed-splint. When the plaster is set the front is cut away,

FIG. 101.—Improved wheel crutch.

the bed is lined with suited soft material, the front is put on, and linings are put in. If it is not perfectly convenient to secure the child in position by lacing it in its plaster bed it may be held firmly in place by bandages. Extension of the affected leg is secured by means of a foot-piece. This dressing is cheap, and efficient in young subjects. In youths and children too old to be carried about it will hardly answer. In children



from a few months to two or three years old it serves a most excellent purpose in the absence of improved appliances, and may be made to meet every requirement so long as the child has to be kept in the recumbent posture.

It is not desirable in the usual course of treatment of hip-joint disease to confine a child to the bed or house, however, and if fixation can be accomplished without confinement in the recumbent posture it is preferable. The length of time that will be required to effect a cure of coxalgia in most cases utterly precludes the possibility of sick-room treatment. Furthermore, in no sense is it desirable. These subjects must have fresh air and exercise, and mechanical appliances that are best calculated to secure these results are those that deserve approval and employment. Young children may be given exercise by means of the wheel crutch shown in Fig. 104.

Not only is the plaster of Paris bandage used in the manner described for the purpose of affording means of securing extension but it is also in general employment for purposes of fixation, in many cases serving a good purpose. In general, however, the

trunk above the pelvis is not sufficiently firmly supported by it and motion of the lumbar vertebrae admits of more or less movement in the joint, with subsequent distortion of the limbs. If plaster of Paris is used for the purpose of fixing the joint it should be put on as shown in Fig. 105, being applied from below the knee of the affected

leg during extension to the lower part of the thorax. In some cases it may be necessary where plaster of Paris is relied upon to secure fixation of the well leg also in order to overcome the possibility of lumbar motion. It will be readily understood, however, that in these cases a clumsy apparatus is liable to be soiled and to cause more or less irritation at its edges, besides causing no little inconvenience and discomfort from the fact that it is a solid bandage, confining the body heat, keeping the child in a moderate perspiration and consequent state of unwhole-



FIG. 104. — The plaster of Paris bandage. (Loret.) By permission of the Trustees of the House of Pains.



FIG. 105. — Willard's hip splint.

someness over the parts covered by the casing. It is to be resorted to where other and better appliances are not at hand, and whenever it becomes necessary to confine a child to the bed in the early stage of coxalgia for the purpose of securing continued extension, especially in the cases of children who are unruly and difficult to manage, where quiescence of the affected joint is demanded.

Many appliances have been devised for the purpose of accomplishing fixation, among them a wire cuirass for Bonnet, the Thomas fixation splint, as invented by Thomas of Liverpool, the Willard leather splint, made of firm leather in a continuous piece which encases the abdomen, lower part of the thorax and the leg on the affected side, as low as the knee, it being applied to the child's form while the leather is wet and subsequently laced, corset-fashion, to suit the necessities of the individual case. In all these appliances the principle is to firmly secure the pelvis in the upper part of the splint and as firmly secure the thigh in its lower segment, the idea being to prevent motion of the head of the femur in the acetabulum. Various instrument houses have manufactured almost innumerable varieties of splints to suit the ideas of individual surgeons for individual cases, and even in country practice, where it is necessary for a child to remain in fixation over a good length of time, it is better that comprehensive works on orthopedic surgery and the prices current of instrument houses be consulted with reference to the selection of a suitable splint in each case. A splint that will apply to one subject may not suit another at all.

Traction splints have also been devised for the purpose of overcoming the reflex tetanoid muscular spasms that are a symptom in the earlier stages of hip-joint disease, this spasm often pressing the head of the femur firmly against the acetabulum, or its rim, resulting in severe pain and sharp spasmodic shocks that are distressing. If traction be applied to the leg with the limb strongly abducted the head of the femur is brought against the rim of the acetabulum, whereas if it is slightly abducted such is not the case. In hip disease where the acetabulum is imperfectly developed and there is softening of the cotyloid ligament traction is applicable, especially when applied with a slight degree of abduction.

Numerous traction splints have been devised. They consist usually of a firm pelvic band, with perineal bands for the groins, a knee belt, a foot support, and a strong metal splint extending from the pelvic belt to the foot support on the outer side of the leg, with a screw contrivance whereby traction may be gradually increased in necessary cases. The long traction splint contemplates fixation of the pelvis by the pelvic belt and extension of the affected leg by means of the screw contrivance, the foot piece being firmly strapped over the instep and ankle, the brace being

held in proper direction by the knee belt. The shoe on the well foot is to be provided with a thick sole, if necessary two or more inches thick, in order that the affected leg when extended by the splint is not longer than its fellow. Sayre, Taylor, Davis and others have devised various modifications, according to their individual ideas, so that the orthopedist has an adequate list to select from. (Fig. 107.)

When the long traction splint is employed it is necessary to properly protect the perineum. The groin bands or perineal bands are likely to cause irritation and chafing. To prevent this the perineum should be bathed frequently, alcohol or bay-rum

being used in the bath, the parts being subsequently carefully and thoroughly dried and powdered. If excoriations occur the band will have to be changed often and the chafed tissues treated according to well known surgical principles. The traction splint is employed by preference over the weight and pulley traction, which, of necessity, confines the patient to the bed. Where fixation and traction can be combined in a suited apparatus the hip-joint child can be kept out of doors and at play on crutches and splints during the whole course of its treatment. Hip-joint disease is essentially a protracted ailment. Its treatment will have to be continued over a period of months in every case, and in most cases, as already stated, over a period of years. Even when a case appears to be perfectly cured relapses are apt to occur and it is necessary, therefore, that traction and fixation shall be employed for a long period of time after all the symptoms have subsided.

FIG. 107. — Hecox's hip-joint apparatus.

It should be borne in mind that when the head of the femur or the acetabulum has been carious, and where there has been proliferation of new cells, the bony tissues are not firm and resistant, as in perfect health of the joint. Consequently even slight injuries are likely to renew the carious inflammation.

It is impossible to lay down set rules to suit all cases. In a general way it is sufficient to say that extension and at least partial fixation should be continued for several months after all acute symptoms have subsided, and that the child should be protected from the possibility of injury to the joint over a period of two or three years after radical orthopedic treatment has been suspended.



Operative Treatment.—Various operations are practiced upon the hip for coxalgia and its deformities; excision of the joint, trephining, incision into the joint, igni-puncture or canterization of these tissues are approved, and all too often are necessary operations. It is not deemed advisable to enter into a discussion of the respective merits of these practices in this connection. Works on orthopedic surgery or volumes upon general surgery should be consulted if more radical measures than those described be decided upon.

Medication.—The properly indicated homoeopathic remedy administered at the proper time will often materially modify disease of the hip-joint patient and in many cases assist in securing recovery. When the ailment comes on as an acute affection with inflammatory symptoms the usual anti-inflammatory remedies will be found beneficial.

Acute is applicable during the first stage, and will often be found useful as an intercurrent remedy during acute aggravations throughout the entire course of the case. In acute coxalgia or acute coxitis, with full, rapid pulse, severe pain, high fever, with the characteristic restlessness and intense thirst, this remedy will be found a valuable agent. The pains follow the track of the cranial nerve, and are drawing, tearing, lancinating in character.

Arnica is especially adapted to the traumatic variety of hip-disease with oppressive pain in the hip-joint, the thigh being extended while sitting in order to obtain relief from pressure. The joint feels as if sprained, the pain is worse at night, of a boring, tearing character, shifting from the joint to surrounding tissue. The joint is swollen, hard, hot and shiny.

Belladonna is applicable in the nervous child with severe paroxysms of pain, with a sense of constriction about the joint and around the thigh, the child being unable to walk on account of the severe pain, constriction and throbbing. The thones over the hip are swollen and burning hot. The pain comes on paroxysmally, occurring suddenly and ceasing as suddenly, the muscles being held in a state of spasmodic rigidity during the pain.

Rhus tox. is applicable to the first and second stages of hip-joint disease with extreme lameness and aggravations of pain from exercise. The pain is worse at night and in damp weather. The muscles of the leg twitch spasmodically, causing sharp shocks in the joint; severe rheumatic pain in the knee with tension and stiffness in the joint, the condition being more that of lameness and soreness of the hip and leg than of acute inflammatory pain, as with *Acute*, *Arnica* and *Belladonna*.

Colocynthis is especially suited to severe cramp-like pains in the sacrum and hip, and crampy pains from the hip to the knee. Upon walking or while at play the child is taken with violent neuralgic pains and cramps in the muscles of the thigh and calf.

the spasms of the muscles being so severe as to seem to hold the femur firmly against the pelvis.

Bryonia is to be thought of when the pains are all worse upon motion or jarring. Pressure of the femur against the acetabulum, the pains being of a darting, tearing character, right in the joint, and accompanied by rigidity and extreme tension of the muscles. The patient cannot bear to be moved, jarred or touched because of the aggravations of pain therefrom. Arthritic and synovial varieties of hip-joint disease call especially for *Bryonia*.

Aster is also especially suited to the synovial inflammations of the hip-joint, the joint being hot and swollen, the tissue edematous and puffy, with vesical complications, as strangury, hot, burning, scalding urination, frequent disposition to urinate and spasmodic pains in the bladder and urethra, these being consequent upon the pains in and about the joint.

Calcarea carbonica and, especially, *Calcarea phosphorica* are applicable in nearly all cases of hip-joint disease at some stage of the case. Hip-joint children are strumous children. They are subjects of tubercular dyscrasia, enlarged glands, are sluggish and lymphatic in temperament, are regular sufferers from headache, perspire freely upon falling asleep, and are in other regards almost invariably typical *Calcarea* children. If hip-joint disease comes on in the early years of life, during or subsequent to the process of dentition, especially if the child has been subject to gastro-intestinal disturbances incident to the teething process, being a pot-bellied child with open fontanelles, unusually fine or unhealthy hair, flabby muscles, scurfy eye-lids, and perhaps the subject of unhealthy skin and nails, *Calcarea carbonica* is its basic remedy. If the disease occur later and there is retardation in bony formation, the fontanelles being slow in closing, the child being generally rickety in appearance, pigeon-breasted, the subject of osteitis, the epiphyseal junctions being slow in ossifying, and perhaps enlarged and tender, *Calcarea phosphorica* will be the homeopathic remedy. Either of these preparations of *Calcarea* should be prescribed in the medium or higher attenuations, not too oft repeated, but continued over a long period of time, over many months or longer if necessary. *Calcarea phosphorica* is more likely to be required for the special conditions of the joint in the third stage, promoting new bony-formation and checking the extension of the carious process. *Calcarea carbonica* is more likely to be required in the second stage in protracted cases with cold abscesses. Both remedies have pain in the thigh, limping gait, atrophy of the nates, aching in the sacral bones, and more or lessened pains in the knee and hip-joint.

Silica will better meet the indications when suppuration is set up and the head of the bone is positively carious. Suppurations with fistulous openings, old sinuses that refuse to heal, resi-

dual abscesses of the joint with intermittent aggravations and new abscess formation, all require *Silica*. It is by far the most excellent remedy when there is a combination of caries of the spine and caries of the hip; the child is of relaxed fibre, of strumous diathesis, with glandular indurations, of earthy complexion and generally feeble.

Phosphoric acid will be found helpful in progressive emaciation from prolonged or profuse suppuration arising from suppressed or uncurd exanthemata. There is pain in the hip-joint, with a sound of grating as the head of the femur moves in the acetabulum. *Phosphorus* is demanded in the typical *Phosphorus* subject, with fistulous openings into the joint, secreting a foul pus, the edges of the sinuses being fistulous or calloused. The child has fever, hacking cough, progressive emaciation, diarrhoea and other symptoms of a general hectic state.

China may be required for a condition similar to that belonging to *Phosphorus*. Prostration from continued suppuration, night sweats, diarrhoea, emaciation, debility, drawing pains in the thighs and bones, with a bruised sensation in the joint. Marked periodicity in the occurrence of aggravations and periods of pain.

Hepar will be called for in strumous patients with acute abscesses and prolonged suppuration. The parts are exquisitely sensitive to the touch, the pain extending to the nates and thighs. If an abscess be inevitable *Hepar* will assist in the formation of pus and thus be of benefit in shortening the duration of the case. If abscess is threatened and it be possible to avert it this remedy should not be administered.

Mezereum has nightly suffering in connection with hip-joint disease, with sharp, stitching pains through the joint extending into the ilium, with boring, burning pains in the nates; the limbs feel stiff, sore and bruised; the child is cachectic, sweats upon falling asleep and from slight exertion, its gums are unhealthy, its bowels irregular, and it suffers severely with nightly pains that cause it to cry out in its sleep. *Dryas*, *Arnica* and *Rhus tox.* are also applicable for the nightly cries of the coxalgia patient, as indicated.

Other remedies that may be found advantageous in the treatment of hip-joint disease are *Lycopodium*, *Kali carbonicum*, *Arsenicum*, *Petroleum*, *Sulphur*, *Lachesis*, *Phytolacca*, *Symphytum*, *Kali phosphoricum*, *Calcarea sulphurica*, *Fluoric acid* and *Mezereum*. In nervous, irritable children who suffer out of proportion to the amount of pathological disturbance that is present *Chamomilla* will often be found helpful.

Hypericum is sometimes a useful remedy for the severe nerve pains of hip-joint disease, and *Coffea* will occasionally secure sleep where other apparently well directed remedies fail to overcome the pain and wakefulness.

CHAPTER CXXI.

KNEE-JOINT DISEASE.

General Considerations—Symptoms and Course—Diagnosis—Prognosis—Treatment—Excision.

General Considerations.—Tumor albus, white swelling, or tuberculous knee-joint is among the commoner joint affections of children, though not nearly as frequent as hip-joint disease and caries of the spine. This affection formerly passed under the name of scrofulous disease of the knee, or white swelling. It begins as an inflammation of the epiphyses, the femoral and the tibial surfaces being attacked with about equal frequency. The patella is rarely the original focus, though occasionally it is known to be the starting point.

Caries of the knee is oftener the result of synovitis than is caries of the hip-joint. Acute inflammation of the membrane occurs from slight injury or rheumatic causes, the effusion being gradually absorbed, the sac infiltrated and thickened, with its inner surface affected by fungous degeneration, this condition eventually extending to the epiphyses and subsequently to the bone with the result that tuberculous degeneration follows, it not infrequently happening that the epiphyses or portions thereof are separated and lie loose in the sac as sequestra.

It is not necessary in this connection to enter extensively into consideration of the pathology of the condition, this properly belonging to works on orthopedic surgery. It is enough to know that partial or complete destruction of the joint is the result when purulent synovitis is present, and also when carious degeneration attacks the articular surface of the bones composing the joint.

Symptoms and Course.—As a rule knee-joint disease comes on insidiously, the initial symptom being more or less of stiffness and weakness of the joint, with corresponding interference with locomotion and unevenness of gait. Where acute synovitis is the causative feature there is likely to be acute pain, heat and swelling of the joint, with sensitiveness to touch, jarring and other motions, and more or less constitutional symptoms, depending upon the acuteness of the attack and the idiosyncrasies of the patient. If of osseous origin the bone is somewhat swollen, as are also the peri-articular tissues. Here the swelling and soreness are not altogether limited to the joint, but radiate upward or downward or both, depending upon whether the femur or tibia or both are inflamed.

If purulent synovitis or simple synovitis with effusion is present the swelling is more pronounced, the patella moves freely, and there will be pouchlike bulging, especially of the inner aspect of the knee, readily observable in thin subjects. The swelling is thus observed laterally rather than anteriorly. When of bony origin bulging of the synovia from the presence of effusion is not observed nor is the patella freely movable. It is raised from its position by a semi-solid mass, and the sensation imparted to the touch is that of general boggy of the joint rather than effusion within the site.

The pain of caries of the knee-joint is not usually severe but is more or less constant, with acute exacerbations occurring throughout the course of the inflammatory process. At these times the pain is worse, and sudden wrenching or twisting of the joint and injuries arising from a mis-step are especially painful. Night-crisis are not observed as frequently as in hip-joint disease, but the muscles of the thigh and knee are occasionally involved in tetanoid spasms, in which cases nightly shriekings are likely to be present.

It is well for the student and beginner to exercise care in diagnosing between knee-joint disease and hip-joint disease upon the strength of pain experienced in the knee. When this is present from caries of the hip there is nothing abnormal about the

knee; whereas, when the pain arises from knee-joint disease the joint is swollen, tender to the touch, hot and edematous, or boggy, depending upon the synovial or bony character of the case. Muscular rigidity, more or less lameness, shortening of the limb, and atrophy of the muscles of the thigh and calf, from non-use and the extra care with which these muscles are exercised, are signs and symptoms of knee-joint disease as the case progresses. As the tuberculous inflammation destroys the articular surface malposition of the leg occurs, with subluxation and flexion of the leg upon the thigh, in some cases being very pronounced. Permanent deformity of the joint may partake of the nature of enlargement or induration (Fig. 128), or it may result in ankylosis, the joint being firmly fixed with the leg in abnormal position, usually more or less flexed, though in some cases adducted. Rotation of the tibia upon the femur also occurs, with knock-knee of affected leg as a result.



FIG. 128. Tuberculosis of knee.

Diagnosis.—Intermittent lameness, enlargement of knee-joint, pain, stiffness, and weakness upon using a limb, with heat over joint and severe pain from sharp jarrings of the knee are diagnostic

symptoms. All these may occur in a case of synovitis of non-tubercular origin, but this affection promptly clears up under proper treatment and pressure evenly distributed over the joint, whereas effusion in tuberculous knee-joint is likely to become purulent in character, involving the joint in abscess or destroying its articular surfaces, thereby causing deformity of the leg. In the synovial type the uniform swelling of the bone entering into composition of the joint, with tenderness upon manipulation, decreased mobility, heat, and constitutional cachexia will make the case clear. In the synovial type where the case has not yet sufficiently progressed to result in destruction of the epiphyses it is not easily possible to differentiate true knee-joint disease from sub-acute synovitis.

Rheumatism of the joint is occasionally confused with carious inflammation. The latter occurs in children of strumous habits, is slower in developing, the suffering is not as acute, nor is there likely to be the general constitutional disturbances that go with rheumatic arthritis. The latter is more likely to occur in well children who have been exposed to inclemencies of the weather, who are children of rheumatic parents, the ailment coming on acutely, being attended by profound constitutional symptoms, as severe fever, headache, intense pain in the joint, with more pronounced degree of heat and swelling, the symptoms all being more violent but yielding more promptly to treatment.

Prognosis.—Caries of the knee-joint, like caries of the hip or spine, is so commonly observed in strumous children, or those whose gentology is certainly tuberculous that the prognosis is not favorable as it relates to permanent cure without deformity. In cases of the synovial type seen early the inflammation may be promptly allayed, and but mild if any degree of disability result. In neglected cases or those of strictly bony origin occurring in subjects pronouncedly cachectic, whose nourishment is bad, and whose sanitary surroundings and personal hygiene are questionable, permanent deformity of the limb with flexion at the knee or subluxation of the tibia, or other complication, is almost certain to be the result. Abscess with complete destruction of the joint, or joint ankylosis, is a common termination in neglected cases. It is almost impossible, unless cases are seen at the start and the joint given effective treatment long continued, to avoid permanent impairment of the knee. In the worst cases in strictly tuberculous children a fatal issue occasionally follows from prolonged suppuration. Severe suffering also produces disturbances of bodily nutrition, and occasionally metastatic abscesses form in remote organs. Purulent synovitis has purulent pleurisy as an occasional complication, while in other cases pneumonia may produce a fatal termination.

Treatment.—In a general way the principles that apply in the treatment of hip-joint disease apply in disease of the knee-

joint. Fixation by means of extension splints as devised by Sayre, Hutchison and others, whereby the leg is extended so that the articular facets of the knee are not allowed to press upon each other, are perhaps the best means of securing the desired fixation and extension. In the absence of these the limb may be wound in sheet wadding and encased in plaster of Paris by means of a roller bandage composed of crinoline gauze impregnated with fine

dental plaster. In order to be effective the bandages must be applied with sufficient firmness over the contour of the calf to form a firm splint for the lower leg, the same result being obtained by close and careful application of the bandage above the knee, thus encasing the thigh firmly and snugly, while the limb is extended by an assistant, the idea being to so apply the bandage that the tibial and femoral articulation will be as widely separated as possible. Other substances from which splints are made are leathers moulded to the limb and stiffened with steel, and poroplastic felt. The Thomas



FIG. 109.—
The Thomas
Knee Splint.



FIG. 110.—Thomas' Knee
Splint Applied.

knee-joint splint (Fig. 109) is a very satisfactory device. It consists of a ring of padded iron fitted so as to surround the thigh at the perineum and fastened to two round rods, one on each side of the limb, longer than the leg and secured to a metal plate below the foot. The thigh ring is pitched at an angle of fifty-five degrees to the upright, this being reduced by the padding to forty-five degrees. The inside upright extends from the perineum to three inches below the sole of the foot, the outside upright extending from half way between the crest of the ilium and the top of the great trochanter to three inches below the sole of the foot, also. Webbing straps are carried from the perineal ring over the patient's opposite shoulder to give support to the extended splint. The leg is fixed in the splint by means of bandages of leather several inches wide securely attached to the splints and laced in front above and below the knee. The foot is secured to the foot piece, it being necessary to keep the tibia from pressing against the femur, the shoe that is worn on the foot of the well leg being provided with a sole sufficiently thick

to compensate for the extra length of the splint worn on the sound leg.

In special cases it is the practice to break down the ankylosis under anesthesia, the limb being subsequently encased in plaster of Paris or other permanent dressing, where it is desirable to produce a straight deformity. Resection of the joint is practiced both for the cure of the original disease and the correction of the deformity.

Excision.—Excision performed under antiseptic precautions with permanent dressings is comparatively a safe operation. According to Mensing, before antiseptic surgery was in vogue excision was attended by a mortality of thirty-three per cent.; after the introduction of antiseptics but before the application of permanent dressing immediately following upon operation the mortality fell to eight and five-tenths per cent. Since the introduction of permanent dressing the mortality in all subjects has been reduced, according to this author, to two per cent. in eighty cases. Ollier's statistics show a reduction of mortality from eighty to fourteen per cent. since antiseptic precautions have become the rule. Other authors record the ratio of mortality at from five to nine per cent. under antiseptics, with practically no mortality in favorable subjects under permanent dressing after excision.

The operation is demanded when the life of the patient is impaired by constitutional disturbances, as severe and exhaustive pain, protracted suppuration, general symptoms of hectic, gradual enlargement of the knee-joint and evident tuberculous destruction of the epiphyses or head of the bone. Partial operations upon the joint have not been found to be satisfactory, surgeons giving the preference at the present time to removal of not only the articular surfaces but the patella also. The operation is performed under anesthesia, a "U" shaped incision being made that starts from one condyle to be carried below the knee, its convexity passing through the ligamentum patella midway between the two tubercles and the neighboring margin of the tibia. Another incision is that known as the transverse, which is carried directly across the middle or upper patella, this being divided transversely with the saw. The sub-periosteal method of Ollier contemplates an incision from above and the outer side of the patella, carried down to the upper and outer angle of the joint, and then along its outer edge and the edge of the ligamentum patella until the tuberosity of the tibia is reached. When the Ollier method is practiced the periosteum, with the muscles attached thereto, is cleared from the bones and the patella is carried over to the inside, while the ligaments are cut and the ends of the bone are protruded through the incision.

The favorite operation is the "U" shaped incision first mentioned. The knife is carried down to the bone throughout the

entire course of the horse-shoe curve and the flap is reflected upward, the joint being freely opened by a second incision whose concavity is in the femoral direction. This starts from the extremity of the first incision and is carried through the tendons of the quadriceps above the patella. As soon as the joint is exposed the tissues surrounding are rendered aseptic and all carious structures are thoroughly scooped out with the Volkman spoon or other bone curette. When curettage is completed the femur is pushed as far over on the surface of the tibia as possible, an incision is made through the softened tissues covering it, and with a saw the articular surface is removed, the line of section being at right angles with the shaft. It should not be sawn away above the level of the epiphysis, as marked by the adductor tubercle. If the bone is diseased beyond this it should be curetted or gouged away. The tibia is then treated in like manner, the upper surface of the semi-lunar cartilages are made to rest upon the sawed end of the femur as a support, and the tibia is sawn through just below the articular lamella. If it be carious beyond this point the gouge should be called into requisition and every portion of the softened bone be removed. If possible the attachments of the posterior crucial ligament should be preserved, this serving to assist in holding the bones in place when the operation is complete. The synovial membrane that covers the posterior ligaments and that lines the posterior pouches of the joint should be dissected off or scraped away. No particle of tissue that is in the least diseased should be allowed to remain, it only serving as a focal point for further extension. If the posterior crucial ligament has been preserved in its entirety it serves to support the bones thoroughly well in young subjects without the application of nails. When it has been divided steel pins or nails that have been rendered aseptic are driven obliquely through both bones near the line of union. Some surgeons prefer to secure the sawed surface in perfect apposition by means of wire sutures, while others rely wholly upon stout chromicized sheep gut sutures. Drainage tubes are inserted within the wound, it is thoroughly washed out with antiseptic solution, all bleeding is checked, and the reflected flap is brought down and neatly and securely sutured. In order to hold the leg in perfect position while union of the apposed ends of the femur and tibia is taking place it is necessary that the splint that supports the leg on its posterior surface be provided with a foot-piece that prevents tilting of the foot forward. Such a splint can be made of wood or metal, and may be provided with cross-bars so that it can be suspended from above in order that the patient may be moved from place to place on his mattress during his confinement.

Various modifications of the procedure just described are adopted in special cases. It is not necessary to enter here into all

the operations for excision of a knee-joint not to elaborate upon the future treatment. The wound is dressed antiseptically, the drainage tubes are withdrawn as soon as the discharge ceases, and the patient is kept in the recumbent posture until firm bone-union has resulted. The permanent dressing plan of treating an excised joint contemplates the thorough drying of the joint by antiseptic gauze and the immediate closure of the wound in all cases where the tissues can be properly apposed, without the use of drainage tubes. In this form of treatment the knee is encased in antiseptic gauze and plentifully covered with other antiseptic dressings. It is then firmly bound to the splint, or encased in plaster, and not undressed for ten days unless constitutional symptoms indicate that something is wrong in the field of operation. Upon removal of the primary dressing at the end of ten days or two weeks the steel nails which have been used to appose the sawed ends of the bone are withdrawn, the wound is again dressed antiseptically, and the usual surgical principles pertaining to operations of this character are strictly followed.

Results.—Without discussing the effect of excision of the knee upon adults it is enough to say that statistics go to show that it is not a favorable operation in children under ten years of age, the subsequent growth of the limb being so seriously impaired that it should be practiced only where the life of the patient seems to be placed in immediate jeopardy. Even then it may be preferable to perform amputation above the knee. In youths and in children approaching the age of puberty the results are more favorable, this being accounted the better age at which to perform resection of the joint. The intention of the operation is to secure a straight leg, the femur and tibia being united as a continuous bone. If failure results it is usually due to the fact that not all of the diseased tissue has been removed. In other cases it may depend upon the removal of too much bone, while in still others the constitutional state of the patient is responsible for the failure of the bones to unite, this occurring when the system is very much debilitated.

MEDICATION.—Remedies that will be found especially valuable in the synovial type of knee-joint disease are, *Aspirin* when there is pronounced inflammation and fever; *Arnica* when it is due to traumatism with general disturbance of the system, severe pains about the joint of a bruised and aching character, the joint being tender, swollen and hot, and *Bryonia* when the synovial membrane is inflamed and effusion is occurring, whether rheumatism be the predisposing feature or whether it arises from traumatism or the tuberculous diathesis. *Bryonia* is a remedy par excellence in all joint affections that are aggravated by motion, pressure, sudden jars and the like, the pains being of a throbbing, pulsating character.

Rhus tox. will be found useful in rheumatic knee-joint disease, and also in the nightly aching and lame and strained feelings that are often experienced in the ham-strings, and even in the anterior parts of the joint. The *Rhus* case is worse at night, in damp weather, from use of the joint, the general trend of the sufferings being to rheumatic-like lameness. *Rhus* is also applicable when the condition simulates the typhoid trait from the presence of tuberculous fever.

Arscenicum will be found beneficial where the child is anemic, the knee-joint hot and swollen, the patient exhausted, the case presenting the general appearance of sepsis from purulent inflammation of the knee.

Aranicum iodatum is especially to be thought of in connection with tuberculosis of the knee-joint with glandular enlargements elsewhere, more particularly if the apices of the lungs show commencing hepatisation.

Ruta graveolens is applicable where the whole joint is bruised and inflamed, and also in synovitis or joint-disease resultant upon a wrench or severe strain of the tendons and ligaments. In this type of case the choice may lie between *Ruta*, *Rhus tox.*, and *Arnica*. *Ruta* rivals *Arnica* for the bruised and sore sensations due to injury, and rivals *Rhus tox.* for the lameness due to sudden sprains or wrenchings of the tissues. *Ruta* is to be preferred where the periosteum is affected.

Mercuro will be found an occasional remedy in the sharp, lancinating, cutting pains that are present in acute exacerbations occurring in the course of synovial inflammation. It is also especially to be thought of in the nightly lancinating pains occurring in the knee joint and elsewhere in syphilitic subjects.

Calcaria carbonica is a basic remedy, never to be neglected in children of strumous habit.

Calcaria phosphorica is of prime value in "scrofulous" children, whose bony formation has been slow, who are slow to walk, slow to cut their teeth, and who are otherwise *Calcaria phosphorica* children.

CHAPTER CXXII.

GENU VALGUM AND GENU VARUM.

Genu Valgum—Treatment—Medication—Operative Measures—Genu Varum—Prognosis—Medication and Diet.

Genu Valgum.—Genu valgum, or knock-knee, is a not uncommon deformity of rickety children generally seen in connection with flat-foot and lateral curvature of the spine. It results from an unnatural growth of the inner condyle which causes the shape of the femur to curve inward and the internal lateral ligament of the knee-joint to stretch, the knees coming close together, the feet

being widely separated. (Fig. 111.) The lower margin of the internal condyle is pulled downward far below the level of the external, due to over-growth of the inner border of the diaphysis. The deformity is generally noticed when the child begins to walk, but in other cases the elongation of the condyle is not sufficiently pronounced to make the condition noticeable until about the age of puberty. Genu valgum is usually double, both legs being affected and generally to the same degree.



FIG. 111.—Genu valgum.

Occasionally but one limb is deformed. If a child has suffered amputation of a leg and is supplied with an artificial limb whereby the body is supported not equally on the two sides the natural obliquity of the femur is apt to result in genu valgum of the sound leg.

TREATMENT.—In mild cases where the deformity is not very pronounced, if the rickety child be taken in hand early it may be so improved by constitutional treatment, proper diet, exercise and hygiene that the progress of the deformity will be checked so that radical measures will not be required. The patient's limb should be so fixed in splints that pressure upon the knee may be in good part avoided. (Fig. 112.) A pad is secured from the inner condyle to the shaft of an extension splint on the outer side of the leg in such manner as to firmly secure the leg in apposition with the splint. After early deformities have been partially overcome in this manner it may be desirable to encase the legs in plaster of Paris, thus securing immobility and preventing inward deflection of the femur. During the management of cases in this manner it is necessary that the child should be placed upon cod-liver oil, nourishing food, as meat, eggs, milk, wholesome bread and other articles of substantial diet, and be given the benefit of

fresh air, exercise, sea-bathing, where possible, and the best of sanitary surroundings.

MEDICATION.—Remedies that may be administered to advantage are *Calcareæ*, especially *Calcareæ phosphorica*, *Silicæ*, *Aurum metallicum*, *Phosphorus*, *Ararum jodatum* and other up-building and structural remedies, the thought being to improve the general state of health of the patient and also to direct remedies to the local condition that are known to have specific effect upon the bony tissue.

OPERATIVE MEASURES.—Osteotomy is practiced for extreme cases of genu valgum. The instruments required for the operation are the scalpel, hemostatic forceps, osteotomes or chisels, a mallet, Adams' saw and a sand bag. The patient is anesthetized



FIG. 112. — Knee-knee brace.

and placed in the recumbent posture. The leg is partially flexed upon the thigh and the thigh upon the pelvis. The site of operation is rendered aseptic, the sand bag is placed beneath the extremity and the bed opposite the site of incision. The knife is entered at the inner side of the knee joint in front of the inner condyle and on a level with the upper border to the patellar articular surface of the femur. An incision is made down to the bone and upward in the axis of the femur for an inch or more. A small aseptic chisel is inserted at the lower angle of the wound, turned to a right angle with the bone, and by means of several sharp blows of the mallet a "V" shaped incision extending three-fourths or four-fifths

through the femur just above the condyle is made. The femur is then fractured by strong adduction, the wound is dressed antiseptically without drainage, and a plaster of Paris dressing extending to the groin is applied. In from two to three weeks this may be removed and the limb held in position by sand bags applied to either side.

Another operation in which the saw is brought into requisition is that devised by Ogston. A suitable incision is made over the upper portion of the inner condyle and a section of it is sawed off with the Adams' saw, thus permitting of the straightening of the knee. An objection that obtains is that the knee-joint is opened, this being a serious objection, because of the danger of infection of its cavity by the introduction of bone dust and blood. The MacEwen operation, as described, is by far the preferable and simpler procedure. It is almost invariably successful, does not attack the joint, and by the degree of flexion of the leg that is

practiced the vessels of the popliteal region are insured against injury.

Genu Varum.—Genu varum, or bow-legs, is the opposite condition to genu valgum. (Fig. 113.) It also is seen in rickety subjects and those of strumous diathesis. In bow-legs the legs are bowed outward, the knees being widely separated, both the tibia and femurs being bowed in proportion to the degree of deformity, the foot being turned in. In children the disease is produced by the rickety state, in subjects of even light weight, while in apparently strong and healthy children it may be caused by too early attempts at walking, especially if they are unusually heavy. When observed in children of this type the deformity is usually overcome as the child grows older, the vigorateness of its constitution enabling it to compensate for the deformity due to too early efforts at walking. In old subjects



FIG. 113.—
Genu varum.

bow-legs is observed as the result of arthritis deformans, this type being altogether incurable.

PROGNOSIS.—Mild cases of genu varum recover with but slight or no deformity, as general improvement of the child's health is brought about by means of constitutional remedies,

nourishing diet and improved hygiene. In children who are just learning to walk in whom a deformity is observed as commencing it is wise to retard their efforts as much as possible, keeping them off their feet, in special cases applying suited braces, to be had of instrument makers, or encasing the legs in plaster of Paris splints. (Figs. 114 and 115.)

TREATMENT.—In confirmed cases osteotomy is performed in about the manner described for genu valgum, the "V" shaped piece being taken from the outer aspect of the femur and where the tibia are badly bowed from their outer aspect, the bones being also subsequently fractured and afterward treated as simple fractures. This operation



FIG. 114.—Bow-
leg braces, single
leg.



FIG. 115.—
Short bow-leg
braces.

is very satisfactory in its results and there is no reason why it should not be performed in suited cases where the deformity is extreme.

MEDICATION AND DIET.—There is nothing specific in the way of medication for the subjects of genu varum. Remedies that assist in developing the osseous system, overcoming the rickety

state and improving the general health of the child will be found valuable aids. Nourishing, supportive diet, consisting of meat, eggs, milk, nourishing vegetables, gluten-flour bread, rye bread and the like, whereby the child is better nourished and strengthened, should be prescribed in every case. If the general vigor of the patient be impaired it may be wise for him to be taken to the seashore or mountains while his legs are in splints, prior or subsequent to osteotomy.

CHAPTER CXXIII.

CLUB FOOT.

General Considerations—Etiology—Treatment—Operative Treatment—Treatment by the Thomas Wrench.

General Considerations.—Talipes, or club-foot, may be congenital or acquired. It occurs in a number of varieties, in some patients but a single deformity existing, while in others the deformity is compound. Four simple forms are described, as talipes varus, talipes valgus, talipes equinus and talipes calcaneus. The compound varieties are calcaneo-equino-varus and calcaneo-valgus.

Talipes equinus is a confirmed extension of the foot, the heel being drawn upward, the posterior ligament of the ankle joint shortened and the astragalus drawn backward. (Fig. 116.) This type is a rare condition as a congenital deformity, though occasionally seen as an acquired mis-shape.

Talipes calcaneus is just the opposite of the equinus. (Fig. 117.) Here the foot is in a position of confirmed flexion, the chief contractures being those of the greater and lesser toes, the anterior tibial muscles, and the anterior ligaments of the ankle joint. The borders of the foot are also drawn up-



FIG. 116.—Talipes Equinus. (Albert.)



FIG. 117.—Talipes Calcaneus. (Albert.)

ward so that the sole is convexed. The foot is so completely flexed in extreme calcaneo talipes that it is altogether drawn away from the floor, the patient walking upon the heel. As will readily be understood, in talipes equinus just the opposite position is assumed, only the toes and the extremities of the metatarsal bones with their muscular and integumentary covering supporting the patient.

The combination of talipes equinus and talipes varus results in the heel being drawn up and the anterior half of the foot being abducted and rotated inwards upon the antero-posterior axis, the adduction and rotation occurring at the transverse tarsal joint. As a result the outer surface of the foot and ankle is the part walked



FIG. 118.—Extreme Equino-varus.

upon. (Fig. 118.) The posterior ligaments of the ankle joint, anterior part of the internal ligament, and the astragalus-scapoid and inferior calcaneo-scapoid ligaments are those which are especially contracted. (Fig. 119.) The contraction of the plantar ligament and the fascia also assist in inducing the concavity of the sole of the foot observed in this deformity. In the severest cases all the ligaments and muscular structures may be involved, contributing to the deformity, even the muscles of the calf of the leg taking their part through the action of the tendo-Achilles in maintaining the abnormal condition.



FIG. 119.—Extreme Equino-varus.

In talipes valgus the foot is everted and drawn outward at the transverse ankle joint. The sole is flattened, sometimes convexed, and the posterior tibial and calcaneo-scapoid ligaments are stretched in proportion to the degree of the deformity, the peronei being shortened.

To summarize, talipes equinus is confirmed extension of the foot; talipes calcaneus is confirmed flexion; talipes varus is confirmed adduction, and talipes valgus is confirmed abduction. The deformity is observed variously compounded.

Etiology.—Two theories are offered to explain the occurrence of club-foot. In congenital cases it is held to occur from pressure of the foot against the uterine wall. While it is not reasonable to believe that uterine compression is a very common cause of the deformity, yet this cause may operate where there is a deficient supply of amniotic fluid, the fetal extremities being firmly pressed upon by the uterine muscle in its rhythmical contractions over several months. Congenital talipes from this cause is due to inter-uterine constrictions, in some cases this being so severe as to all but strangle an individual extremity. Amputation of a foot or hand has also occurred from undue uterine contraction, and the presence of rigid amniotic bands.

Talipes is observed, however, as occurring with plentiful supply of amniotic fluid, and although in special cases it cannot be doubted that continued pressure may have to do with the produc-

tion of the deformity, yet in the majority of cases it is believed to be a result of abnormal development of the foot and ankle.

tion of the deformity, in some cases pressure marks being plainly discernible at the time of birth, yet it is so often the case that there is no deficiency of liquor that other causes have to be looked for. Here it may be classed with such deformities as spina bifida, ancephalus, hare-lip, web-fingers and the like.

Besides pressure applied directly to the feet and ankle by the uterine muscles various extreme positions of the feet and legs act as operating causes. The infantile extremities may be so interlocked that extreme calcaneo-valgus of one foot and equino-varus of the other have resulted. Club-hand may arise from the same cause and genu recurvatum, also, often depends upon faulty position of the child in utero, especially in rickety children.

Going beyond these local causative factors it is well to bear in mind that deficient fetal development is productive of talipes in all its forms. It also occurs as an acquired deformity from various forms of infantile paralysis, the sound muscles driving the foot in directions opposite to the paralysis. It may also arise from contraction of muscles and ligaments that are normally developed, whose opposites are deficient in strength, stunted in growth or altogether absent.

Treatment.—Congenital cases usually present as double club-foot, the feet being affected equally and similarly. It is nearly always of the type of talipes equino-varus, or compound club-foot, in which the heel is drawn upward and the anterior half of the foot is abducted and rotated inward. If it is possible to restore the foot to its proper position by safe manipulation it should be so restored, and a plaster of Paris bandage applied that will keep it in position for weeks at a time. The same result may be obtained by using a leather splint or a tin talipes shoe, which may be a continuous piece or with a joint at the junction of the foot and leg pieces. A talipes splint may be made of thin sole leather, of felt that has been treated to starch or plaster of Paris, or may be made of heavy felt without either of these stiffenings. It should be grooved or shaped so as to surround the posterior portion of the leg and fit snugly about the ankle joint and over the sole and sides of the foot with the foot in proper position. This is then bandaged on with roller bandages with sufficient firmness to keep the foot in proper relation to the leg, the splints and bandages being worn as long as necessary, even reapplied from time to time. In very young children the starch bandage applied over cotton batting will answer a good purpose. Various club-foot shoes have been devised that answer an excellent purpose, with or without tenotomy. These are not as serviceable as plaster of Paris or the thin sole leather or felt splint in young children, but in those who are walking and in whom deformity is increased by exercise a firm shoe supported by proper braces is absolutely necessary.

OPERATIVE TREATMENT.—In pronounced cases of talipes equino-varus tenotomy is necessary. For division of the *tibialis posticus* the limb should be laid upon its outer side upon a firm pillow—the child being anesthetized—and the posterior border of the tibia be located. The tenotome is passed above the inner malleolus in such position that its point strikes the edge of the bone. The knife is slipped close to the bone, between it and the tendon, on the flat, the edge being then turned at right angles with the tendon, cutting edge backward, and as the foot is held down, as if to correct the deformity, a gentle sawing motion of the blade will sever the tendon, it giving way gradually under the tension that the surgeon applies to the foot with the free hand. As complete relief of this tension is observed to occur the knife is withdrawn. Division of the *tibialis anticus* is made upon the dorsum of the foot, just beneath its insertion into the cuneiform bone. By moving the foot in various directions the *tibialis* is easily felt and the knife is passed beneath it on the flat, division being effected as in the case of *tibialis posticus*. Division of the *tendo Achilles* is accomplished by inserting the tenotome just above the tendon, between it and the bone at its narrowest part, the knife being passed nearer to the tibia than the tendon and slightly beneath it, the incision being made on the inner side of the limb, it resting upon its anterior surface. It is better to insert the blade while the tissues are held upon the stretch, it being then easier to locate the tendon. If placing the foot upon the tense means to draw the tendon too close to the tibia, rendering insertion of the blade between the two uncertain, the foot may be relaxed and the tendon grasped between the thumb and finger of the left hand, thus keeping it out of the way of the knife. The incision is made parallel with the axis of the tibia, the knife being subsequently rotated until its cutting edge is at right angles to the tendon, which is then gently sawn through, giving way under pressure applied to the foot as the blade severs its strands. In some cases this yielding of the *tendo Achilles* under incision is sharply pronounced while in other cases it is hardly, if at all, noticeable. Care must be exercised that other structures are not severed. The foot is subsequently dressed in plaster of Paris or other firm dressing, being kept in proper position until union is secured. In cases due to paralysis of individual muscles it is better not to immobilize the foot but to apply a movable apparatus whereby massage and electricity may be employed. For this purpose various devices have been made by instrument makers. Club-foot apparatus with hinge-joints, whereby the position of the foot in its relation to the leg may be changed at will, are desirable for this purpose.

Talipes calcaneus may be overcome by appliances made for its treatment, tenotomy being necessary in extreme cases only. Elastic tension has been used as a correcting and extension appli-

ance, the tension being applied in the direction of extension of the foot. In extreme cases it may be necessary to operate upon the tendo Achilles to produce shortening. This is accomplished by making an incision through the tendon obliquely from above downward and from before backward. The cut ends are then made to overlap until the desired shortening is effected, when they are stitched together by sheep-gut or kangaroo-tendon very firmly. Not only are the severed ends of the tendon sutured in such a way that shortening is produced to meet the requirements of the case, but stitches are taken through the integument in order to produce complete union and a dense cicatrix.

TREATMENT BY THE THOMAS' WRENCH.—The Thomas wrench shown in Fig. 120 is an apparatus for the purpose of

causing forcible extension of the foot in equinovarus, the shortened ligaments and tendons being torn and ruptured under the pressure applied until it is possible to bring the foot in proper position with the leg. By this appliance the foot may also be twisted inward or outward, according to the compounding of the deformity, and in cases not too old the tendon Achilles can be ruptured also so that

the foot may be placed in any position the surgeon desires. In some cases it is necessary or at least desirable to perform tenotomy also, not relying upon the wrench absolutely.

Efforts at correction of the deformity of club-foot by means of the wrench must, of course, be done under anesthesia. Fig. 121 shows the wrench in position upon the feet and Figs. 122 and 123 are illustrative of an ugly case of equinovarus with the result obtained after the use of the wrench, partial tenotomy having been performed upon the tendo Achilles before the foot could be brought



FIG. 120.—
Thomas wrench.



FIG. 121.—Thomas wrench. Foot in position.

in position. (Finney.) The rupturing of the contracting tendons is followed up by encasing the foot in a plaster of Paris case, which is allowed to remain on from two to three weeks. If necessary it may be removed earlier and if it be found upon removal that the deformity is not altogether overcome the child may again be anesthetized, the wrench applied and the remaining deformity be corrected by a second crushing.

In confirmed cases when the tissues entering into the anatomy of a compound deformity are contracted and firm the wrench method will be found satisfactory, tenotomy being performed only upon tendons that are unusually firmly contracted and unusually dense. In the severest cases casts may have to be worn for two or three months, and if because of the long continuance of the deform-



FIG. 122.—Equino-varus. (Finney.)



FIG. 123.—Equino-varus corrected. (Finney.)

ity certain sets of muscles have atrophied and are not sufficiently strong to properly support the weight of the body and properly perform their functions it may be desirable to use a suitable club-foot brace for some time after the operation.

A late method of operation has been devised by Hopkins, of Philadelphia, who acts upon the principle that as Pott's fracture of the fibula would serve to correct the deformity existing in equino-varus an operation upon that bone that will result in its fracture, with easy dislocation of the joint in the direction to overcome the deformity, is a permissible procedure. An incision two inches long is carried down upon the fibula to within half an inch of the external malleolus, five-eighths of an inch of the shaft of the bone are resected with the bone saw, forcible abduction of the foot to that degree necessary to correct the deformity is practiced, the separate ends of the operated fibula are drawn fairly close together,

being left perhaps but a sixteenth of an inch apart, and held in apposition by a fine silver wire or in young children by silk worm-gut sutures through minute drill holes in the separated fragments. The operation is done under antiseptic precautions and the wound made is dressed antiseptically, the foot and ankle being encased in a plaster cast, which is allowed to remain until healing is completed.

It is not likely that either of the operations described will suit all cases. Choice will have to be made between tenotomy, the wrench operation, the Hopkins operation, forcible correction of the deformity by various devices and contrivances, and efforts to overcome it in younger subjects by means of the splints already described or by suitable deformity apparatus.

Club-foot children are not necessarily strumous or otherwise cachectic. The deformity is seen in vigorous children as well as in those who are weak and delicate. As a rule, medication is not required. If, however, the subject be of cachectic habit the proper constitutional remedies should be exhibited before, during and after operative treatment. The proper diet must be prescribed and necessary change of climate availed of if the best results are to be hoped for in any of the operations for club foot in delicate subjects.

CHAPTER CXXIV.

HARE-LIP.

General Considerations—Treatment by Operation.

General Considerations.—Hare-lip is a congenital deformity consisting of one or more fissures in the upper lip, the result of arrest of development of fetal life. It is commonly seen in association with deformity of the palate and oral vault. It is generally located a trifle to one side of the median line, corresponding to the junction of the inter-maxillary and superior maxillary bones. If only one side of the lip is affected it is denominated single hare-lip, whereas if both sides of the labia are involved it is known as double hare-lip. In extreme cases the fissures may extend into the nostrils and be complicated by a wide separation of the lateral half of the hard palate, with great deformity of the mouth and face.

In single hare-lip there may be a mere notch on the margin of the lip, or a deep, wedged-shaped fissure forming a complete division and extending into the nose. In double hare-lip, always associated with cleft palate, the extremity of the frontalis nasi process is completely detached from the maxilla, and often from the vomer with deformity of the pre-maxillary bones.

Treatment.—The treatment of hare-lip is by operation looking to the correction of the deformity. It has been performed in the earliest days of infancy, even within a few hours after birth. Some surgeons deprecate the early operation, preferring to postpone it until the child has attained the age of several months, while others, where the deformity is not sufficiently pronounced to interfere with nutrition of the infant, put it off even longer, or until the child is two or three years old. In simple cases the operation is simple,



FIG. 124.—Hare lip; lip with nasal deformity.

consisting of separating the lip beneath from the gum, paring the mucous membrane of the fissure, bringing the denuded surfaces in apposition, securing them by means of sutures applied as in an ordinary



FIG. 125.—Hare lip after operation. (Wilcox.)

wound, or if the structures are deeply separated, whereby extra tension would be placed upon the sutures, by inserting hare-lip pins, held in position by the figure-of-eight suture applied over them.

In all operations for hare-lip anesthesia is requisite, chloroform being preferable. The head should be firmly held by an assistant in sitting posture at the head of the operating table, his fingers pressing the facial arteries as they pass over the jaw. The coronary arteries may also be compressed, if necessary. The lips are freed by dividing the folds of mucous membrane, keeping close to the bone as separation is accomplished. The edges of the lip are pared and the raw surfaces are brought together in as perfect apposition as possible. Nelaton's incision contemplates an inverted "V" shaped incision made above the cleft, the length of the two sides of the inverted "V" depending upon the degree of deformity that is to be overcome. A silk ligature is passed through the incision and drawn downward, thus inverting the flap and bringing together the apposing surfaces which may be at once secured with sutures. The objection to this procedure lies in the fact that though the red line may be perfectly adjusted in the infant the vertical cicatrix is apt to contract later in life, leaving a slight deformity.

It is not considered necessary to enter into discussion of the various operations for all cases of labial and nasal deformity occurring from this cause, nor to consider cleft palate in this relation. Many of these cases demand the exercise of great ingenuity and require no inconsiderable surgical ability upon the part of the operator. The Homœopathic Text Book of Surgery and other standard surgical volumes will have to be consulted in this relation. The essential thought is to appose the vermillion border of the lip, to unite the orbicularis oris muscle by means of deep sutures, and to appose the integument so that the least possible degree of cicatrization will result.

In extreme cases comprising cleft palate, absence of the nasal septum, and double hare-lip, the greatest amount of surgical inventive genius is requisite, and not infrequently successive operations will be required to overcome the deformity, as also to correct contractions with consequent deformity, resulting from operations upon the deformed structures.

CHAPTER CXXV.

INFANTILE HERNIA.

General Considerations—Symptoms and Course—Treatment—Operative Treatment—Prophylaxis—Medication—Unilateral Hernia.

General Considerations.—Hernia is seen in infants as a congenital affection, and occurs also shortly after birth, or within the first year of life, because of the peculiar anatomical conditions that favor it during and prior to birth. Just before or soon after birth the vaginal process of the peritoneum, extending from the cavity of the abdomen to the bottom of the scrotum, closes near the head of the epididymis, being thus divided into two cavities, one of which, the tunica vaginalis propria funiculi, lies along the whole length and in front of the spermatic cord, the other, the tunica vaginalis propria testis, spreading out and embracing the testicle. At about the time this division occurs the upper part of the canal begins to close from the internal ring downward, or becomes constricted near its middle. Normally, complete closure of the superior canal occurs at the close of the first month of life. For various reasons, some of which are difficult to understand, the canal becomes patulous or closes but imperfectly. In other cases it closes below, leaving the upper portion open, thus favoring the occurrence of hernia. The testicle does not always descend at or prior to birth, and if unusually delayed but eventually accom-

plished it is almost certain to open up the funicle and be followed by funicular hernia.

Symptoms and Course.—Hernia in infancy usually comes on suddenly during straining efforts at stool or hard crying spells, from colic or other cause, at which time severe abdominal contractions occur. The descent of the intestine may be arrested at any point in the peritoneal process and thus either funicular hernia or scrotal hernia follow. In severest cases the bowel descends promptly under hard muscular straining, with scrotal hernia as the immediate result. In acquired cases, those coming on slowly, the tumor gradually enlarges, at first being scarcely perceptible, the descent being made slowly. The peritoneal folds become separated gradually, the hernia being strictly a funicular one until the peritoneal constriction above the head of the epididymis is completely opened. In many cases the intestine alone descends, while in other cases hydrocele of the cord is associated with the hernia, it being difficult for the physician to determine between the two, or to decide whether both are present in the same subject. Congenital hydrocele occasionally occurs entirely independent of hernia, though more often the two are observed together.

Treatment.—Treatment of infantile hernia implies reduction and maintenance of the intestine within the abdominal cavity. This will have to be accomplished by evenly applied pressure by means of an infantile hernia pad, which consists simply of a perineal band to which is stitched a flat button covered with sufficient thickness of linen, or other suited material, to afford compression at the site of the hernia, the band being passed between the thighs in the perineal fold on the affected side and secured above on that side by means of a buckle, tie-tapes, or stitched in position, a cross band extending from the site of the compression or near thereto across the abdomen over the opposite hip and to the perineal band on the infant's back. This is perhaps the simplest truss that can be devised and as a rule answers very well during the early months of child-life. If the hernia is permanent it may be necessary to procure an infant truss from an instrument maker and apply it over the hernial protrusion.

OPERATIVE TREATMENT.—It is not often desirable to operate for hernia in infancy. If the hernia should become strangulated the treatment will be that for strangulated hernia in adults. The Heatonian method of treatment by an injection composed of equal parts of extract and fluid extract of *quercus alba*, as taught by Heaton of Boston, the injection being introduced by the Heaton syringe, is allowable in some cases, the thought being to set up adhesive inflammation whereby the peritoneal surfaces are agglutinated, with the result that the canal is closed. As a rule it is better to defer active procedures until the child is several years old,

when the radical operation for hernia, as described in works on general surgery, may be performed.

PROPHYLAXIS.—Infantile hernia, whether threatening in the inguinal region or at the umbilicus, should be guarded against in children who suffer severely with colic, or who strain severely at stool, by the application of a firm binder over the abdomen and in the groin, a corset-like contrivance or harness, made of firm muslin, in cases in which such support seems necessary. As a rule the infantile abdomen should not be constricted by bellybands or close fitting clothing, it being desirable to encourage natural support by the muscular walls, care being exercised to avoid so supporting them in belly-splints that normally muscular contraction and exercise are done away with. Upon the slightest presence, however, of umbilical hernia or funicular hernia the weakened tissues should be supported in the manner described.

MEDICATION.—While it is hardly reasonable to suppose that internal remedies will avail very much in the prevention or cure of hernia yet too many clinical cases are recorded in homeopathic literature to ignore the possibility of assistance in this direction. As prophylactic remedies medicines that overcome colic, constipation, dysentery and other conditions that cause straining and that are, therefore, likely to induce hernia, should not be overlooked.

When a hernial protuberance is observed *Rhus tox.* or *Arnica* should be promptly administered, depending upon whether the condition has occurred suddenly from traumatism, as immediate separation of the peritoneal process, in which event *Arnica* will be required, or whether it has occurred gradually, from severe straining and gradual weakening of the funicle, when *Rhus* will be demanded. These remedies, when indicated, should be given in medium or high attenuation extending over a period of time. If the child is cachectic, *Sulphur* or *Calcaria* may be of benefit. If the hernia is constricted and inflammatory symptoms are observed *Acute*, *Belladonna* and *Ferrum phosphoricum* should be considered, while in strangulated hernia *Nux. vomica*, *Veratrum*, *Plumbum* and *Stramonium* are to be remembered. *Calcaria carbonica* is especially to be thought of in infantile hernia in delicate children.

Remedies that will cure colic and severe infantile constipation are those that will serve the best purposes in the avoidance of hernia, while remedies that are applicable in such injuries as sprains, wrenches, bruises and the like are those that will be more serviceable in overcoming the condition when it is already present.

Umbilical Hernia.—This variety occurs in two forms, congenital, wherein the visceral plates fail to unite, a portion of the intestine and, in extreme cases, portions of other contents of the abdomen protruding, and the type due to stretching of the umbilical cicatrix shortly after birth. In the first, or congenital type, the coccyx, even, may protrude, owing to the method of its devel-

opment, in still other cases the liver bulging into the rent and perhaps other abdominal viscera protruding into the opening. A peritoneal sac extends along the tissues of the cord, and should strangulation occur gangrene and death may follow. In cases in which the hernial protrusion is large the peritoneum may be so thinned as scarcely to be observable.

The treatment of umbilical hernia will depend upon whether it is congenital or post-natal. In the former the sac must be ligatured or excised and sutured immediately after birth, the contents being first returned to the abdomen. If this is not done the tissues dry and adhere to the bowel, causing colic, constipation, and, perhaps, obstruction.

Post-natal umbilical hernia should be treated by returning the protrusion and applying a firm belly-binder with a flat compress directly over the hernia. Anything in the nature of a round or ovoid compress tends to separate the walls the further. The compress attached to the binder should be large enough to completely cover the opening in the abdominal parietes. It may be well to draw the parietes snugly together by adhesive straps beneath the compress, or to sink a sheep-gut stitch through the integument and abdominal walls. In other cases it may be necessary to freshen the edges of the aperture and close with sutures, as in radical cure of hernia or abdominal wound for celiotomy. If necessary the same may be opened, and the neck ligatured and sewed into the opening with sheep-gut.

If umbilical hernia should become strangulated it will have to be treated as strangulated hernia elsewhere.

CHAPTER CXXVI

INFANTILE HYDROCELE.

General Considerations—Symptoms—Treatment—Medication.

General Considerations.—Hydrocele occurs in infants in connection with hernia when the communication between the tunica and the peritoneum does not close, and also occurs as a congenital affection with congenital hernia. In many cases it disappears spontaneously, while in others it exists over a considerable period of time, even throughout life. It may be the result of injury inflicted upon the infant at the time of birth, but is more commonly the result of a lack of closure of the funicular process of the peritoneum through imperfect fetal development, and, when occurring as an acquired ailment, is the result of constitutional debility of the infant due to constitutional dyscrasia, of whatever character.

Symptoms.—An infantile hydrocele is, as a rule, pyriform in shape and translucent. If occurring at the upper part of the canal it is more apt to be cylindrical. In special cases it is almost globular, often ovoid, in form, and the degree of tension that is present is pronounced, the tumor being resistant and firm. In some cases, especially where the upper part of the canal is closed, continued pressure upon the sac will cause a portion of the contents to recede into the abdominal cavity.

Hydrocele of the cord is another condition that is seen in infancy as well as in adult life. Here the peritoneal process is not altogether obliterated, a small portion of it remaining patulous at some point along the cord. It is recognized as an oblong, elastic, translucent tumor situated along the course of the cord, sometimes extending within the inguinal canal, in other cases confined to the cord without that opening. A similar condition is observed when cysts form in the areolar or other tissue outside of the peritoneal process. If these are numerous, even though small, they may be mistaken for diffuse hydrocele of the cord, or that form in which the cord is pretty well surrounded by a hydrocele sac.

Treatment.—Infantile hydrocele is a simple ailment. A large proportion of cases recover spontaneously in the course of a few weeks or months. Others respond to the application of pressure by means of a compress, applied a good deal as the hernial compress is applied in infancy, promoting absorption of the fluid contents of the sac. Various local medicaments have been used to cause absorption, as iodine, iron, tannin, collodion and the like. They are generally irritating to the skin and not especially helpful. If necessary the fluid may be withdrawn from the cord and a drop or two of iodine be injected. In most cases it will be sufficient to evacuate the sac by means of a small aspirator or large hypodermic needle, or to incise it with a small bistoury, evacuating the fluid contents and allowing the walls to collapse. This usually suffices, particularly if followed by gentle pressure, to effect a cure.

Hydrocele of the cord is treated in much the same manner, by free incision of the sac with packing of iodoform or other medicated gauze, resulting in closure by adhesive inflammation.

Medication.—Beyond question it may be possible to promote absorption of the fluid contents of a hydrocele by means of a constitutional remedy. Cases have responded under the author's care to *Sulphur* in unhealthy subjects of scorbutic taint, to *Apis* where the tumor is perfectly translucent and no constitutional dyscrasia is noticeable, and to *Graphites* in the lymphatic subject with a tendency to emmenaral flabbiness and unhealthiness of integumentary structure. *Calcaria*, *Palustilla*, *Abrotanum*, *Aralia*, *Povonum* and *Calcaria sulphurica* have been credited with cures of infantile hydrocele and are worthy of study in this connection. *Argemone foliata* or *Iodine* may be demanded in children of

tuberculous habits. *Dryness* is an excellent remedy for effusion, wherever located, and if the general symptomatology of the case indicates it it will doubtless be of value in promoting absorption of the effusion of hydrocele.

CHAPTER CXXVII.

CIRCUMCISION.

General Considerations.—Operation.

General Considerations.—Adherent prepuce and unusually long fore-skin are the cause of a great many nervous reflexes in early life. The Jewish practice of circumcision was based upon sound reasoning and was doubtless made a part of the church-rite in order to secure its universal adoption. When it is considered that so strong and vigorous an animal as the healthy horse is rendered completely unfit for service by a foul sheath it may be understood how the delicate nervous system of a sensitive child may be severely shocked when constantly irritated by retention of balanorrhoeal secretions beneath the adherent or partially adherent prepuce, and unusually long fore-skin. From time immemorial it has been considered advisable to perform this simple operation where it has been possible to trace local affections of the genito-urinary apparatus directly to this condition, but only within recent years, since the physiology of nervous reflexes has become better understood, has it become a generally accepted operation with thinking surgeons. Not alone for local conditions is the operation demanded. In all cases in which male children are suffering nerve tension, confirmed derangement of the digestive organs, restlessness, irritability, and other disturbances of the nervous system, even to chorea, convulsions, and paralysis, or where through nerve waste the nutritive facilities of the general system are below par and structural diseases are occurring it should be considered as among the lines of treatment to be pursued.

A like rule obtains with reference to female children. In general practice the sexual organs in both sexes should be carefully examined by the general practitioner in early infancy, and at various times throughout child-life, with reference to the correction of deformity or unnatural conditions that may be present. In the male the prepuce may be too long, the natural secretions being retained beneath it until the sheath is unhealthy, offensive and exceedingly irritable. In other cases the prepuce may be adherent to the glans, and globules of smegma, from which the moisture has been absorbed, may be firmly pressed against and even

into the delicate corona glandis, causing intense nervousness and pronounced though remote reflex disturbances. In still other cases a degree of phimosis that is annoying and harmful to health may be present.

Imperforate prepuce is occasionally observed, the condition being distressing when it is impossible for the infant to void its urine because of the lack of an opening in the prepuceal integument. This is an exceedingly rare condition, but occasionally occurs, while in many children the integumentary opening is so small that the urine can be voided with difficulty, passing only in a pin-sized stream and by the exercise of sheer force upon the part of the patient.

The presence of retained smegma and other unnatural conditions of the prepuce, as adherence to the glans, is a frequent cause of priapism in infancy, this condition resulting in no little nerve waste to the innocent subject. In the opposite sex the clitoris is often firmly bound down by an adherent hood; numerous reflexes arising therefrom. It has become quite the rule to examine the sexual organs of male children at or soon after birth, but, on the other hand, it is equally the rule to neglect to examine girl babies. As children of the weaker sex grow their more delicate nervous systems begin to show the effect of genital irritations, and many a case of chorea, confirmed headache, nervous jactitations, paralytic weakness, unusual irritability, melancholia or other abnormal state of the nervous system long remains uncured because of failure to make careful examination of the condition of the genitalia and relieve irritations and adhesions at this site.

It is not the intention to delve into the theories of orificial surgery in this relation, it being sufficient to observe with emphasis that abnormal conditions of the sexual organs in children of both sexes are among the greatest and most prolific causes of disturbed nervous vitality. Such being the case it is the imperative duty of the physician to insist upon careful examination of every infant and sick child entrusted to his care. Even such structural diseases as tuberculosis of the hip, knee or spine have responded to well directed agents upon overcoming the nerve waste of the general system due to sexual irritations, after having before resisted all treatments that have been applied. No matter how serious the constitutional defect, no matter how remotely removed from the sexual organs, no matter how unnatural and unreasonable it may seem to look to the genital system for the etiological factor that is operating to rack the sympathetic nervous system, and thus disturb the harmony of the vital organs, impair the health and even destroy the life of the individual, attention should always be given to this part of the human anatomy whether the illness be of the nature of a nervous reflex or profound structural disorganization. If the genital organs be in a

state of perfect health no harm is done; if, on the other hand, there be abnormalities of the character described the best directed efforts of which the physician is capable are certain to be thwarted in proportion to the degree of departure from the normal that is found to obtain in the sexual apparatus, and the degree of delicacy and sensitiveness of the organic and sympathetic nervous system of the subject.

Operation.—Circumcision is performed by drawing the prepuce well forward and amputating as much of it as is necessary to uncover two-thirds of the glans penis. The child should be anesthetized, preferably with chloroform, though in some cases it has been deemed sufficient to use cocaine by means of the hypodermic syringe, by which local anesthesia is produced. I have not found cocaine especially satisfactory and the objection obtains that where the amputation is performed in the cocaineized tract satisfactory union is not always the result.

The prepuce being drawn well forward it may be grasped by an ordinary pair of phimosi or dressing forceps compressed with sufficient firmness to keep the glans well out of the way. The redundant integument and mucous membrane in front of the blades of the forceps are snipped off with scissors or knife, as preferred. It is not always necessary to use the forceps, the fingers often sufficing; but in children where the penis is very small it

will be found more convenient to grasp the integument as described. In older subjects the phimosi forceps may be used to



FIG. 126.—Tortat's Phimosi Forceps.

advantage. As soon as the redundant tissues are amputated the cutaneous sheath is allowed to retract, the mucous membrane is then slit up along the dorsum of the glans to the limit of its attachment, each half is cut off in a line corresponding with the circumference of the corona, leaving the frenum intact, with just enough of mucous membrane through which to pass sutures inserted at convenient distances, these uniting the raw surfaces of the integument and mucous membrane.

Some surgeons simply snip off the integument, subsequently trimming the mucous membrane, allowing the tissues to lie in apposition and unite without suturing. I have known of several cases where this practice has been followed by wide separation of these tissues, with slow healing and a considerable-sized cicatrix as the result. I very much prefer to use from four to eight very fine sheep-gut sutures, by which the edges of the mucous membrane and integument are snugly apposed and allowed to heal by immediate union.

It is well not to amputate too much of the foreskin, leaving enough to cover the delicate cornea glandis to protect it from the

chafing of the clothing, and it is wise to perform the operation with as much care as though it were a major one, it being desirable to so appose the tissues and unite them that there will be no penile irritation from cicatrices or other cause.

The Pratt operation is performed by drawing the prepuce well forward by two tenacula inserted in the integumentary meatus opposite each other, or by Emmett's reversible tenaculum, the anterior margin of the prepuce being drawn well away from the glans. It is then incised in the usual manner and stitched as described. It is especially a convenient way of performing circumcision in adult subjects, and possesses advantage for convenience and nicety of operation in children that commends it.

In the female child it is not necessary to circumcise by amputation of the hood of the clitoris. Adhesions should be broken up by means of a spud or blunt-pointed probe, or by the fingers. Digital separation will answer in most cases, it not being necessary to resort to instruments. As in male subjects so also in girls; subsequent attention from time to time is demanded in order to be certain that adhesions which have been separated are maintained free. The clitoris may be covered with lanoline or other suited ointment after being unhooded, and in boys the prepuce may be treated in like manner.

It goes without saying that all operations of this character should be performed with exceeding care and delicacy, that they should be done under antiseptic precautions, and that the subject whose nervous system has been considerably impaired by virtue of the pathological conditions which have existed shall have the benefit of such assistance as is to be rendered by proper constitutional medication.

CHAPTER CXXVIII.

SURGICAL TREATMENT OF DIPHTHERIA.

General Considerations—Intubation—Operation of Intubation—Method of Operating—Retention of the Tube—Removal of the Tube—Caution—Tracheotomy—The Operation—Insertion of the Tube—Attention to the Tube—Indications for Removal.

General Considerations.—When the larynx has been invaded by the deposit of diphtheria and stenosis is threatened it may become necessary to have recourse to surgical measures in the attempt to save life. The initial symptoms of laryngeal invasion are hoarseness and aphonia, more or less complete. It may be that these will be preceded or accompanied by a sudden rise in temperature, a degree or two above the thermometer's recent

register, but the loss of voice and the oncoming of dyspnea will tell their own story of threatened laryngeal stenosis. Within a few hours, usually, of the presence of aphonia, stridulous breathing will be observed, the inspiratory effort being more marked than that of expiration. With increase of the dyspnea, whose progress is usually distressingly rapid once it has been manifested, there is soon developed commencing cyanosis, due to imperfect oxygenation of the blood. From a pallor the countenance becomes livid and subsequently cyanotic in high degree, capillary stasis showing over the entire body surface. From the difficulty of breathing the features become distorted, and the chest heaves and bulges, the diaphragm retracting and the epigastrium sinking, every respiratory and accessory muscle being exercised to the utmost as stenosis increases. Owing to imperfect oxygenation capillary bronchitis, pulmonary edema or lung inflammation may follow upon laryngeal invasion, greatly increasing the seriousness of the case and making surgical interference absolutely imperative. Not should artificial relief be too long postponed. The more certain the invasion of the larynx, the greater the dyspnea, the more pronounced the cyanosis and the more imperfect the oxygenation the greater the danger to life and the less certain the possibility of relief from surgical efforts. Imperfect arterialization of the blood adds an additional menace to life, and when well selected constitutional measures fail to give relief the knife or the tube should be resorted to without waiting to make its employment a resort *dernier*, unlikely to be attended by benefit.

Surgical efforts are restricted to intubation and tracheotomy. The former means the introduction of a metal tube into the larynx, the latter the opening of the trachea with the scalpel and the introduction of a tracheal tube through the surgical wound thus inflicted.

Intubation.—This is a recent procedure and a much more simple operation than tracheotomy, though its successful performance requires an exact knowledge of the anatomy of the throat and a nicety of skill not possessed by every one. As the name implies, it is the insertion of a tube, with the object of occupying the larynx with a resisting cylinder through which respiration can be carried on during the critical few days of threatened laryngeal closure. There is advantage in the avoidance of a cutting operation in intubation, an advantage the non-surgical attendant will not be slow to appreciate, and an argument of much favor with parents. Furthermore, there is, in favorable cases, no surgical wound created whereby local diphtheria may be set up and further infection and complication ensue. On the other hand there are some disadvantages. Necessarily the tube must be small, hence the opening in it is correspondingly small and liable to become occluded by the deposit and throat secretions, this necessitating removal

and re-insertion, which procedure has sometimes to be repeated a number of times in a given case. Again, the very presence of a metal tube in the larynx is likely to excite coughing in exceptional instances, much to the discomfort of the patient and the almost certain ejection of the tube, though, fortunately, this result is rare; and it must be remembered cases calling for the consideration of any surgical procedure are of the most desperate character, so that minor objections and possible additional dangers



FIG. 126. — Wachen's Intubation Case.

have usually to be swept aside as not weighing against the more pronounced liability of certain death unless better respiration be quickly established. Moreover, the relief the sufferer obtains from his labored efforts at breathing the moment the tube occupies the larynx is wonderfully satisfactory, and almost instant relaxation and sleep ensue. An additional negative suggestion is that the pressure of the tube against the mucous

membrane during the presence of diphtheritic inflammation causes softening, occasionally resulting in erosion, whereby a new avenue for infection is established.

The advantages argued by the friends of tracheotomy are the removal of the site of operation some distance below and out of the way of the deposit, the "day-light" nature of the wound and the consequent easier access to the same, with its more accurately administered attention. There is also the advantage arising from the use of the larger tube. On the other hand it must be borne in mind that there is added the danger of anesthesia. For tracheotomy without an anesthetic, except in the already comatose patient, is barbarous, and likely to induce heart-failure because of the pain and resulting struggles of the child. And besides the objection of having an open surgical wound it must be remembered that the introduction of air directly to the bronchi and lungs is more likely to induce bronchitis and pneumonia than when it is warmed by its passage through the mouth, pharynx and larynx.

In addition to the disadvantage named as belonging to intubation there are the additional ones of danger of injury to the soft parts from lack of skill of the operator, the difficulty of extracting the tube, which sometimes is more than its introduction, the possible danger of pushing the membrane farther down before it, and also

the remote possibility of the "swallowing" of the tube into the trachea and bronchus. But these seem to be more than offset by the fact that there is no loss of blood, little or no pain, no shock, and not nearly as much danger of septicæmia or erysipelas as from the open wound of tracheotomy; furthermore, there is not left a granulating wound requiring weeks for its healing.

In regard to the relative saving of life of the two operations it is clearly proven by statistics from a large number of sources aggregating a large number of cases that intubation and tracheotomy offer about equal advantages in older children and adults, while in children under three years of age the figures are greatly in favor of intubation. It must be borne in mind that it is not always an easy task to find the trachea in very young children with full, plethoric throats. Bosworth's deductions are that tracheotomy promises the best results above the age of five years, while he holds that intubation is superior below four years of age, the operations possessing equal advantages in children between four and five years. It will be understood, of course, that when the indications are that the disease has progressed to the trachea and bronchi intubation will not avail anything.

The operation of intubation is often resorted to in desperate cases of general systemic infection, and should never be denied, even in certainly fatal cases where asphyxiation is impending. The rather frequent resort to this procedure in this type of cases increases its mortality rate, naturally, and this fact should be borne in mind in selecting between the two operations by statistics alone.

OPERATION OF INTUBATION.—While intubation as at present practiced is decidedly a modern procedure—its re-introduction and scientific application belonging to Dr. Joseph O'Dwyer, of New York, who restored it to a place among the successful modern operations of today in 1880—the idea of tube-insertion for laryngeal stenosis dates way back in the centuries. Hippocrates first advised that a pipe stem should be inserted into the throat to admit air into the lungs, and in France in the eighteenth and early part of the nineteenth centuries various devices were constructed for the purpose of preserving the patency of the throat; but these have all been abandoned, and tracheotomy was for a long time the only surgical procedure acknowledged as possessing any merit in throat occlusion.

O'Dwyer's intubation instruments (see cuts) consist of, first, a set of tubes of different sizes varying from one and one-half to two one-half inches in length and of varying calibre; second, an introducer; third, an extractor; fourth, a mouth gag; and fifth, a scale.

The tube is an ovoid cylinder, bulging at its centre, and is fitted with a rounded head at its upper extremity, a collar, which lies upon the ventricular bands when in situ, thus preventing the

instrument from falling into the trachea. The anterior angle of the head is perforated for the insertion of a cord, used for the recovery of the instrument in case of failure to properly insert it in the larynx, or in case of the blocking of the tube by the detached membrane, or other accident.

The introducer (Fig. 127) consists of a long slender rod with a handle. Outside of the rod is a sliding tube, operated by the button seen on the upper surface of the handle. The distal extremity of the introducer is a long jointed rod, curved to a right



FIG. 127.—Introducer.



FIG. 128.—Extractor.

angle with the shaft, which passes completely through the intralaryngeal tube. That portion of the introducer which passes completely through this latter is jointed in such a way as to facilitate its withdrawal. The object of the sliding portion of the introducer is to detach the laryngeal tube after it has been placed in the larynx.

The extractor (Fig. 128) is an instrument devised for withdrawing the tube when desired; its action will be easily understood by the figure. It is constructed on the principle of the



FIG. 129.—Mouth Gag.

curved forceps, with the exception that the small blades seen at its distal extremity are in apposition. When this instrument is inserted into the upper end of the laryngeal tube the small blades are opened by pressing on the lever, thus enabling the operator to withdraw the tube. The small set screw in the handle of the lever is to regulate the extent to which the blades are opened, especially with reference to the avoidance of injury to the surrounding parts in case the instrument is inserted outside of the tube.

The mouth gag recommended by O'Dwyer is the Denhardt instrument (Fig. 129), the handles of which are bent back in such a manner as to hamper the manipulation in the least possible degree.

The scale (Fig. 130) has been arranged by O'Dwyer to show the size of the tube best fitted for the different ages: thus, a tube reaching from the lower end of the scale to No. 1 is the size adapted for children a year old; to No. 2, for children two years old, etc.

METHOD OF OPERATING.—The child should be placed in a sitting position on the lap of an attendant, with the head resting firmly against the shoulder, the hands held or firmly secured by a binder passed around the body; the gag is then inserted into the left side of the child's mouth as far back as feasible; an assistant stands immediately behind the child, holding its head firmly, and slightly elevating the face. The operator stands immediately in front of the patient, with the



FIG. 130.—Scale.

introducer held lightly in his right hand, passes his left forefinger into the fauces and searches for the epiglottis, and, failing this, the cavity of the larynx. As soon as he is convinced that the tip of the forefinger is beyond the epiglottis and immediately over



FIG. 131.—Set of Tubes.

the cavity of the larynx the handle of the introducer is brought down upon the chest of the child while the tube is passed back into the fauces along the side of the left index finger, which acts as a guide. The handle of the introducer is then elevated and at the same time the distal extremity of the tube

is carried backward along the index finger until it is immediately over the laryngeal entrance, when it is directed downward and carried quickly into position, the successful introduction of the tube being ascertained by the left index finger. As soon as the tube is in situ it is detached from the introducer by pushing forward the sliding tube by means of the button on the upper surface of the handle, the manipulation being aided by the firmer grasp of the instrument, which is secured by the index finger on the small trigger to be seen on the lower side of the handle of the introducer.

In withdrawing the instrument the joint in that portion of the introducer which fits into the tube enables the operator to extract it in an almost direct line, thus avoiding any awkwardness of manipulation otherwise necessary. During the removal of the obturator it is necessary to keep the index finger of the left hand on the shoulder of the laryngeal tube to prevent its withdrawal with the obturator, and also to assist in the removal of the cord which has been attached to its rim. This, of course, should not be done until the success of the operation is demonstrated in the relief of dyspneic symptoms.

Courage and dexterity are required in the introduction of the tube, which should be performed quickly and deftly when attempted. It is not always easy, however, to direct it into the larynx. The presence of the membrane, and the swollen, turgescient and softened condition of the tissues efface the usual anatomical landmarks and the effort is, not infrequently, but little more than an attempt to place a tube in the throat. In one case the author was wholly unable to insert the tube in front of the epiglottis, it finding its way into the esophagus at every attempt. The child was nearly three years of age and had never spoken, so I comforted my conscience and excused myself to the parents by believing and explaining a laryngeal malformation. A postmortem examination was not asked for. By no means is intubation the tyro's operation. But it is often successful and deserving of employment at the hands of physicians who would not undertake to perform tracheotomy.

It must be remembered that time is an important factor, and that the child's dyspnea is apt to be increased by the presence of the mouth gag, the surgeon's finger or fingers, and the instrument within the oral cavity. Bungling and long-continued efforts are not justifiable, and their practice may result in the charge resting against the operator of choking the child to death. The whole procedure should occupy but a few seconds. Intervals of rest between unsuccessful attempts at intubation are absolutely necessary for the patient's safety.

To avoid intubation of the esophagus the handle should be well elevated in order to throw the tube well in front of the epiglottis. The evidence of esophageal intubation is the low introduction of the tube and failure to relieve the dyspnea. When the introduction is fairly into the larynx there will be such a degree of relief as to afford positive evidence of the success of the effort. The breathing will immediately improve, deep inspirations will be taken with a great sigh of relief, the blueness of the lips and face will begin to clear very promptly if systemic infection be not over profound, and the whole facial expression will at once change from dire distress to that of comfort and relief. The total absence of this improvement implies a failure to enter the larynx or the push-

ing of the membrane down the trachea before the tube. This accident will be clearly manifested upon the withdrawal of the instrument. The child will struggle more violently than before and cough it up, or will become more and more asphyxiated and death will quickly end the scene, unless tracheotomy be at once performed. If, instead of this unfortunate accident, the esophagus has been entered the case will go on as before, and renewal of the effort at intubation after a minute or two of rest, with the handle of the instrument more elevated at the finish than before, and the larynx well elevated from without, should be practiced.

It may become necessary in individual cases to remove the tube because of its occlusion by the exudate or mucus, in which event it should be thoroughly cleansed and immediately re-inserted. Should the dyspnea not immediately cease upon its re-insertion it indicates that the larynx or trachea has become further involved or partially occluded by loosened membrane, and tracheotomy may have to be performed. But unless such stenosis occurs the tube may be immediately replaced. The same procedure should be pursued in case it is ejected in the act of coughing, but this is not likely to happen unless the tube be too small, in which case it is better to introduce the next larger size.

Ulceration of the soft tissues resulting from the pressure of the tubes is not a complication of very great gravity, and is not very likely to present until the instrument has been worn some days. In fact, it is usually the outcome of the too long continuance of the tube in the larynx. When it is shown that the throat is rendered sore from its presence the tube should be removed and proper treatment administered in cases in which it is severe enough to demand attention. Difficulty of deglutition is one of the most annoying complications presenting itself in intubation. The presence of the metal instrument in the larynx sometimes interferes seriously with the act of swallowing, making it necessary to restrict the nourishment largely to fluids, which should be taken very cautiously in order that they may pass into the esophagus. In cases in which it is impossible for the child to swallow without more or less strangling it may be sustained by allowing it to suck liquids through a tube while lying in the prone position.

RETENTION OF THE TUBE.—It is quite a nice point to know just how long to allow the tube to remain in the throat. The average of time quoted by O'Dwyer in one hundred and fifty-eight successful cases during which the tube was retained was a little more than five days; the longest time it was allowed to remain was fourteen days, and the shortest time fourteen hours. The younger the child the longer the tube will be required, it being rarely safe to remove it in children of two or two-and-a-half years in less than a week. Naturally, the subsidence of fever and the absence of dyspnea will indicate the lack of further necessity for its presence.

REMOVAL OF THE TUBE.—The removal of the tube is quite as difficult a procedure as its introduction; in fact, even more difficult in many cases. In order to remove it as easily as possible the index finger of the left hand is passed well down into the laryngeal opening until the collar of the tube is felt in the larynx. The distal end of the extractor is then passed in against the left fore-finger in position until the tip is directly over the aperture in the collar, into which it is next passed by slight elevation of the handle and downward pressure of the right fore-finger upon its shaft. When the tip of the extractor is fairly within the aperture its blades are supported by pressure on the lever, and the tube is thus grasped by it in such a way that it can be withdrawn. It can be readily understood that it may require the exhibition of no little knack and ingenuity to insert the point of the extractor in the tube; but a little patience will usually accomplish it, and under no circumstances should force or undue haste be exercised.

CAUTION.—As in efforts at introducing the tube, spraying or swabbing the throat, detaching membrane or other treatment about the diphtheritic mouth great care should be exercised that the physician's finger be not injured by the patient's teeth. The use of the mouth gag is absolutely necessary to the introduction of the tube, and it may be used in its removal, unless other simpler methods for preventing forcible closure of the jaws upon the attendant's finger prove sufficiently protective.

Tracheotomy.—Tracheotomy is an old operation. It is said that it was first performed by Rœnlapius two thousand years ago, and was practiced for several centuries, when it fell into disuse for an equal period of time. It was subsequently revived and has long been a standard operation. But the use of the tube for the purpose of keeping the wound open is a much later invention, the objection to the use of any device for this purpose arising from the belief that the windpipe wound would not heal if kept open any length of time.

The instruments required for the performance of tracheotomy are a scalpel, two tenacula for separating the wound, a sharp hook for fixing the trachea when exposed, a grooved director and a couple of ordinary thumb forceps. Scissors, needles, sheepgut and silk ligatures, an artery forceps or two, and, of course, a tracheotomy tube and cannula complete the necessary armamentarium.

Tracheotomy is not alone a diphtheritic operation. It has been practiced for edema of the glottis, acute and chronic laryngitis, involving the sub-mucous tissues, neoplasms of the larynx, syphilis and tuberculosis of the vocal box, stenosis from accidents, and, perhaps, other conditions. But it is chiefly performed for laryngeal diphtheria, the term being used here synonymously with membranous croup. In rare cases tracheal incision is employed in the search for foreign bodies in the windpipe of bronchi.

In diphtheria the indications for its employment are the same as those calling for intubation, as dyspnea, cyanosis, impending asphyxiation, with labor for breath, distortion of the features and profound anguish and distress, weak and rapid or unusually slow heart action, and other distressing symptoms of greatly impeded respiration. The relative advantages and disadvantages of tracheotomy and intubation have been sufficiently discussed in the consideration of the last-named procedure. It is enough to repeat that tracheal incision is preferable, as a rule, in subjects above five years of age and equally desirable with intubation in children in the fifth year. No hard and fast rule can properly govern in this matter, however, and it may often have to be resorted to in young children. And, manifestly, tracheotomy is called for in all cases demanding intubation, in which the latter measure fails of success. It is impossible to so clearly depict the conditions calling for either operation as to reduce their selection to mathematical certainty. Very much must be left to the common sense and judgment of the physician, and better is it to err on the side of surgical measures, especially intubation, in all the severer cases of laryngeal diphtheria, than to allow the patient to suffocate when, perhaps, life may be saved by surgical means.

Anesthesia should be employed in all cases calling for tracheotomy, excepting in instances in which the stenosis is sudden and violent, from plugging of the larynx by unsuccessful efforts at intubation, or partial detachment of the membrane during coughing or desperate efforts at inspiration. Emergencies of this character require emergency measures, and there is usually no time to administer an anesthetic; besides, the unconsciousness which quickly supervenes upon such accidents generally renders it quite or altogether unnecessary.

Chloroform is the best anesthetic for tracheotomy. Etherization takes too much time. Vomiting is more apt to follow, and greater irritation of the respiratory tract occurs, with consequent greater secretion of mucus to annoy and complicate the situation. Ether, furthermore, has a profound stage of excitement, and its incessant swallowing keeps up constant movement of the larynx to the disadvantage of the surgeon. Chloroform produces anesthesia much more quickly than ether, does not act as an irritant on the respiratory membranes, and its only disadvantage lies in the depressing effect upon the heart, which already has about all the load it can carry. But if this agent be given carefully, with plenty of air, there is not more danger than from ether with its uglier respiratory excitation. Cocaine may suffice with adults, and is ample with children so far as the integumentary incision is concerned. But the opening of the trachea is attended by pain and the struggling that ensues in subjects too young for self-control renders it unsuited to tracheotomy in children. When relied

upon, the hypodermic injection from fifteen to twenty drops of a four per cent. solution over the site of operation, will induce sufficient anesthesia to render the integumentary incision painless, its effect lasting over a period of several minutes.

THE OPERATION.—Tracheotomy may be performed at one of four sites, viz.: through the crico-thyroid membrane, crico-thyroid laryngotomy; through the cricoid ring and the upper ring of the windpipe, laryngo-tracheotomy; through two or more rings of the trachea above the thyroid gland, super-thyroid tracheotomy; and infra-thyroid tracheotomy, which, as the name implies, is tracheotomy below the thyroid gland.

The crico-thyroid operation has in its favor the non-cartilaginous character of the tissue incised, an advantage not possessed of much value, and the disadvantage of danger to the crico-thyroid artery. It is not often selected. Laryngo-tracheotomy is a popular operation, but possesses the disadvantages of possible ossification of the cricoid cartilage, the possible danger of necrosis of the cartilage from tube pressure, and its nearness to the disease-process, another objection to the crico-thyroid operation also. This supra-thyroid site is the most favorable of all, it being more remote from the disease than either of the foregoing, and the trachea being easily accessible with no blood vessel of any size in the field of operation. The infra-thyroid site, while still further away from the field of exudation, possesses the manifest disadvantage of the trachea being deeply buried in adipose tissue, making the operation more difficult of performance and opening to possible infection a larger surface of incised tissue. This site should be selected, however, in thin subjects and in malignant diseases of the larynx, the idea being to get as far away from the seat of the disease as possible. In exceedingly urgent cases it is not always permissible to take time to map out the landmarks, necessity demanding that the surgeon stand not on the order of operating but that he let air in the trachea at all hazards.

While the anesthetic is being administered the patient will be properly prepared for the operation. The dorsal position is best, the shoulders being elevated on a pad, folded towel or book, the head being thrown backward in order to put the throat upon the stretch. The field of operation should be rendered thoroughly aseptic by being washed with soap and hot water, bichlorided or not as the operator prefers, and afterward with ether, taking it for granted that there is time for this as the chloroforming is being done. All instruments should be scalded and the operator's hands rendered as aseptic as possible. The surgeon can use two or three assistants to advantage, and if possible to get such a one in time should always have at least one skilled helper at the opposite side of the table.

The incision should be in the median line, from an inch and a half to three inches long, according to the age of the patient.

(Fig. 132). After having made a free integumentary incision careful dissection should be practiced. In the supra- and infra-thyroid operations the thyroid gland must be hunted for and saved



FIG. 132.—Tracheal Incision.

from injury if possible. In supra-thyroid tracheotomy the sterno-thyroid muscles will have to be separated with the handle of a scalpel and held aside with retractors, the deep fascia picked up and snipped with knife or scissors and a grooved director passed beneath it, upon which it is raised to ascertain if any blood vessels are in danger. If in the way these should be ligated or clamped, the areolar tissue over the trachea should be explored and the cellular tissue and vessels be pushed aside to bring the trachea into view. This is now picked up with tenacula, drawn firmly into the wound and incised into its long axis to a sufficient extent to admit of the introduction

of the tracheal tube. The supra-thyroid incision is commenced a little lower down, opposite the middle of the thyroid cartilage, and is extended downward two-and-a-half inches or thereabouts. The steps of the operation are the same as for the infra-thyroid until the level of the thyroid isthmus is reached. If this happens to be well up it may be necessary to make a transverse nick in the deep fascia over the cricoid cartilage and above the isthmus, in order to slip the handle of the scalpel under the isthmus, push it downward and out of the way that the trachea may be sufficiently exposed for safe incision.

Laryngo-tracheotomy is exactly the same as infra-thyroid tracheotomy, with the exception that the tracheal incision has to be carried through the cricoid ring and into the cricoid-thyroid membrane, while in the crico-thyroid operation incision of the membrane only is performed.

The laryngeal operations are not considered as desirable as the tracheal operations proper. The tube is not retained as well, vocalization is very much interfered with, and the tissues of the larynx are far more sensitive than is the trachea. Other objections present themselves, also, as the necessity for a smaller tube, danger of cartilaginous necrosis, and the possibility of reflex spasm of the glottis.

Where rapid performance of the operation is rendered necessary by immediately impending asphyxiation it will not be possible to enter into detail work. The larynx and trachea should be grasped and drawn forward from the spinal column, the head being thrown back and the skin over the throat put upon the stretch. A quick plunge-incision is made with the bistoury directly through the tissues into the crico-thyroid membrane, and

with a sawing motion the bistoury is carried downward and forward through the cricoid cartilage and upper rings of the trachea, the integumentary incision being enlarged as the knife is withdrawn. Or, the larynx may be drawn well forward and cut right into with quick downward incisions, the tracheal rings being divided in the same way. Both operations have been very successful in emergency cases, and with reasonable care there should be no serious injury from the rapid operation.

INSERTION OF THE TUBE.—Once the trachea is opened, no matter what the operation, the tracheotomy tube should be at once inserted. Various patterns of tube have been used, the one now most generally used bearing the name of Trousseau, the distinguished French clinician. It really consists of two tubes, an



FIG. 133.—Trachea Tube.

outer one, which is attached to a shield to which tapes are fastened to keep it in position (Fig. 133), and an inner tube which is removable and which fits the outer tube or cannula very closely. The tubes are made of silver and are so curved that when placed in position the flange, or movable collar lying against the throat, the tracheal portion of the instrument, will conform to the axis of the windpipe. (Fig. 134.) This is necessary for the avoidance of undue irritation to the trachea. The nonfenestrated tube is accounted the most desirable, and it is better to have it of uniform calibre and not too long. The collar is made movable in order to accommodate it to the breathing movements of the trachea, and the shield with tape-holes is for the purpose of attaching tapes to pass around the child's neck to hold the instrument in situ. Tracheal dilators may be used to advantage in opening the tracheal wound for the introduction of the tube, and a fenestrated guide is useful in passing the tube to its place.



FIG. 134.—Goossoon's Split Cannula.

There are several tubes in a set and one should be selected for use that closely fits the tracheal incision and windpipe. They vary in size from a quarter of an inch to seven-sixteenths of an inch in calibre and are graded to the years of the patient about as follows: From three to six years, the smallest tube, one quarter of an inch; six to nine years, five-sixteenths; nine to twelve years, seven-

sixteenths. The silver or aluminium instrument is better than the vulcanite, whose breathing calibre is not as great in proportion to the size of the tube because of its increased thickness, and which being brittle, is more likely to be broken upon withdrawing the inner tube, should it become stopped.

ATTENTION TO THE TUBE.—Once securely and snugly introduced the shield should be made to appose closely but comfortably to the child's neck and the tapes should be placed around it and tied to keep the instrument in situ. The end of the tube should be loosely covered with gauze, two or three thicknesses, that nothing foreign be allowed to be drawn into the bronchi. The atmosphere of the room must be kept equable and warm, 70° to 75°, to guard against pneumonia; and because of the liability of directly inspired air to cause dryness of the trachea and bronchi it should be kept somewhat moist by the use of the steam-kettle or other vaporizer. The gauze over the tube should also be kept moist for the same reason.

Should the disease have already invaded the trachea, or should it subsequently do so, the tube may become filled with its exudate or it may become choked with bronchial or tracheal mucus. In either event it may be cleaned out with a feather or camel's hair pencil, or may be emptied by a suction syringe. Occasionally a physician with greater zeal than judgment will, in emergency, empty the tube by sucking its contents into his mouth. I cannot imagine that such a procedure is ever justifiable. If a tube with a flexible inner tube be used the latter may be withdrawn and reinserted as often as stoppage occurs. In emergencies where no tube is at hand a section of hose from an ordinary domestic syringe may be made to serve as a make-shift until a tracheotomy instrument can be obtained. Or a section of a common curved glass tube used for drinking purposes will serve a good turn temporarily.

INDICATIONS FOR REMOVAL.—The tube should be worn until general improvement of the patient has set in and until he can breathe through the larynx with the mouth or the tube closed. Usually it will have to be worn but a few days, at most from seven to eight days. If allowed to remain longer than necessary it will cause ulceration of the trachea, or granulations will spring up around the tracheal opening and perhaps of themselves cause considerable stenosis. In case of excessive granulations the curette may have to be used for their removal, and it is always well to know that the trachea is perfectly patent before closing it and the external wound.

The recoveries from tracheotomy are recorded as being twenty-seven and fourteen-one-hundredths per cent., so that probably one-fourth the cases that would otherwise die of diphtheritic stenosis are saved by this operation.

CHAPTER CXXIX.

NEVI.

General Considerations.—Treatment.

General Considerations.—Nevi or mother marks are capillary angiomas, vascular or erectile tumors, that are composed of blood vessels. They are usually wholly confined to the integument, though occasionally extending into the subcutaneous tissue. They are made of enlarged and twisted capillaries and anastomosing vessels, surrounded by fat. Nevi are seen as congenital marks, or occur within the first few weeks of life. If composed of arterioles they are of bright pink color, while if made up of venules they are darker, even bluish in color. As a rule they are but slightly elevated above the integument, in most cases not at all. Where of trifling size they disappear spontaneously or become so thin as the child grows in size as to leave practically no deformity. In other cases they are large, covering several inches of area, and if seen upon the face or other exposed surface cause ugly deformities. They assume all sorts of shapes and in many instances are supposed to resemble some object, as a strawberry, from which the name strawberry mark occurs. When the result of maternal impressions during pregnancy they are assumed to take the shape of the object at which the mother became frightened or which made profound impression upon her mind, though this is largely fanciful.

Deep nevi form rounded, doughy or spongy tumors, which diminish in size upon pressure and assume a bluish tint over considerable areas of adjacent integument. Cavernous nevi are made up of large spaces with thin walls carrying blood, arteries sending the blood into these spaces and veins carrying it away. They involve the skin and subcutaneous tissue, and in some cases become so extensive as to be termed nevoid lipoma. They are not only observed upon the surface of the body but may occur in the liver, kidneys, walls of the intestines and other parts of the system. They have an expansive pulsation and their surface is irregular and wormlike to the feel.

It is only, however, in the simple birth marks of the face in young children that the pedologist is interested. These may occur upon the eyelid, cheek, ear, lip or elsewhere. They are generally superficial, though occasionally presenting as erectile tumors.

Treatment.—If large, spreading over a considerable surface of the face and neck, especially the latter, they are not effaceable and had better be left alone. Simple red, pink or bluish blotches are removable by a continuous course of electrolysis, a fine electrical

needle being inserted at the margin of the nevus, ten or fifteen cells of zinc carbon battery being employed in the form of galvanism. The needle must be sharp and not allowed to remain in the tissues more than fifteen to thirty seconds. If but one needle is at hand the nevus may be treated throughout its whole circumference at a single sitting, and subsequently be treated over its surface. A better method is to employ an instrument containing a dozen or fifteen needles one or two millimeters apart, the whole nevus being treated at a single seance. Under the action of galvanism the discoloration blanches, the skin rising in wheals, this passing away after withdrawal, only the points of puncture remaining visible. A thin crust forms over the surfaces treated in from twenty-four to thirty-six hours, which falls off in a few days. If necessary the process may be repeated in a month or six weeks, though in very light nevi a single seance often suffices. Larger nevi that are elevated above the skin may be ligated off under hare-lip pins, or by means of Erichson's sutures. If large and cavernous complete excision of the angiomatic mass is the better method. Various escharotics have been employed for the purpose of destroying the nevus, and astringent injections have also been resorted to. Even if successful these are apt to cause ugly scars and are not to be used. When presenting as tiny, globular tumors nevi may be ligated off with a fine silk thread or snipped off with delicate scissors, the bleeding being checked by pressure forceps.

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